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Cost of Car Heating.

NEW YORK, April, 6, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE :

In the *Railroad Gazette* of March 27 you gave an interesting statement of the relative cost of heating cars by steam and electricity. Now, would it not be in order to compare the costs between the two more common modes of warming cars, viz., by stoves and the Baker car heater?

The writer, as you know, has had pretty good opportunities to test this matter during the last 30 years, and here gives the facts as follows: When fires are required, a car stove with a 10-in. fire grate, with ordinary draft, consumes about 10 lbs. of hard coal every hour; thus in 24 hours, one stove consumes 240 lbs., and the two stoves required consume 480 lbs. The ordinary Baker heater requires 90 lbs. of coal to first get its about 300 ft. of 1½-in. pipe "hot all round." After this a hod of 30 lbs. will, and does, keep a 65 or even 70-ft. car for 12 hours in the coldest of weather.

The reason for this is obvious. The stove has but about 11 sq. ft. to heat from, while the hot water heater has about 150 sq. ft. of hot water heating surface. What one lacks in quantity of surface has to be made up in quality or intensity of heat on that surface. While the hot water heater has its 300 lineal ft. of 1½-in. pipe (equal to about 150 sq. ft. of heating surface) run around the car, it also has the same amount of stove surface as one of the stoves.

Now let's have some figures as to the fuel expenditure in car heating from the would-be railroad economists.

WM. C. BAKER.

Importance of Collecting Demurrage on Freight Cars.

FEBRUARY 20, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read the comments in your last issue on the disturbance in the Chicago Car Service Association, threatening the breakdown of the admirable agreement which is the foundation of that association and by which thousands, if not millions, of dollars, have been saved during the past five years in keeping freight cars moving instead of standing still. What you say in commendation of the demurrage system is true, every word, and the only criticism upon it is that you do not say enough. It is indeed a shortsighted policy that finds it necessary to impair the value of 100,000 freight cars, more or less, carrying freight to and from Chicago, for the sake of granting a slight favor to some shipper who will return it by shipping a few thousand bushels of grain. It would be far better, for the general interest, for the road which desires to secretly favor a shipper to cut rates directly, for in weakening the demurrage rule the road is at the same time stabbing itself.

At the same time starving itself.

To prevent secret discriminations probably is impossible. Starving traffic men will grasp at any bread in sight, even if it is 90 per cent. sawdust. But can the not see that any one of a dozen other methods of manipulation would be less harmful to the road? The establishment of demurrage rules and their more or less successful enforcement for the last five years have constituted one of the most definite improvements in the whole railroad service during that time, albeit the main part of the benefit is in most cases beneath the surface. But the benefit from added car-service, with the corresponding postponement of expenditures for new cars, is an important element in the financial result at the end of the year, notwithstanding the very small space the subject takes up in the president's report.

One of the important principles on which the car service associations are managed, that of having all bulk cars accounted for and all rebates or discounts paid only through a manager who has no close connection with the local agent, is one which seems to be of growing importance in railroad traffic matters. It is a roundabout method, but indirection seems to be necessary here. As competition grows sharper agents find it more and more difficult to be sufficiently friendly to the customer, and at the same time just to the road. In their zeal to get business they are likely not only to let the brakes off, but, also, to "lose their air." To guard against this danger it is highly desirable to have a machine in which it will be possible at any time to produce enough friction to check its speed. In other words, the independent car service manager, with instrumentalities to interpose delay, furnishes a valuable means of introducing enough red tape to keep agents from being too easy with customers.

In trying to have a single individual (the station agent) at a medium-sized station perform all the varied functions necessary to the conduct of a successful freight and passenger traffic we are attempting the impossible, and it is time that more careful attention should be given to systematizing the business so as to produce better results.

The above statements are borne out by experience at every place where car service collections are faithfully made. And wherever the regulations are adapted to the situation by a skillful man they meet the approval of the heavy receivers of freight. Our best car service association managers are now having the satisfaction of receiving the voluntary commendation of lumber and coal dealers, who have come to realize that reasonable rules prohibiting the use of cars as store-houses will always work to their benefit by keeping irresponsible competitors out of the field.

S. J. C.

S. J. C.

The Block System on the Chicago, Milwaukee & St. Paul.*

The St. Paul Company has blocked its trains for a number of years. Until within a few years, however, the blocking was wholly done with the train order signal and by the train dispatcher.

Six years ago, or thereabouts, it began the erection of special signals with special wires for block working under the direct charge of the operator, and this system has been gradually extended until it now covers more than 1,200 miles. The remainder of the company's line is still blocked by the use of the train order signal, but it is the intention to continue the extension of the special signals and the management looks forward confidently to that time when all its main line will be covered by the newer system.

A double arm single post semaphore signal, standing normally at danger and controlled from the telegraph office, was adopted at the outset and its continuance justifies the conclusion that it is satisfactory from our point of view. In locating the signal we place it where it can best be seen by an approaching engineer and where it is also visible from the telegraph office and generally on the opposite side of the track from the station building and as nearly in front of the telegraph window as possible. We endeavor to obtain a sky background for the arms and to so locate the signal that it will not come in line with buildings which limit the view. If telegraph poles or crossarms line up with the signals we remove them, unless this occurs at a slow speed point where it is not necessary for engineers to see the signal any considerable distance. If the station is located on a curve and it is impossible to bring the signal into view by increasing its height, a distant signal interlocking with the home signal is erected. If there are buildings on both sides and close to the main track, such as water tanks and coal houses, we erect a bracket signal which brings the arms directly over the track.

An independent telegraph wire is constructed and each station furnished with an East and a West sounder, wound up to 50 ohms; no relay being used. There are also two keys and a ground switch in the equipment of each office. The switch is so arranged that the block wire is grounded at each station, but by moving the switch lever to a central point the ground is removed, enabling the operator, when reporting a train, to communicate with the offices on either side at the same time. Sounders are so adjusted that they can be distinctly heard above several ordinary telegraph instruments. As the block wire is used exclusively for block working and grounded in each office, the movement of the sounder readily attracts the attention of the operator.

In the early installations it was believed to be the better practice to retain the train order signals. As the system was extended to other divisions, however, the block signal was made to do the work of both, and the result was so satisfactory that after several years use of both methods, the separate train order signal has been dispensed with on all lines where the semaphores are in use, and this may be considered to be the settled practice for future installations. We found it to be a fact that where two signals were in use trainmen paid less attention to one than the other. On those divisions where the separate train order signal was dispensed with in the beginning there has never been a case where a train ran past the block signal but where there were two signals, failure to regard both the train order and block signal has occurred.

Permissive blocking is always objectionable, but there appears to be no way of avoiding it on single track if traffic is heavy and important, without too much expense. From the first we made provision for the movement of trains, permissively, by means of a permissive card issued by the operator upon receiving authority from the train dispatcher. This authority was given by simply telling the operator on the wire to card a certain train, but this resulted in an unnecessary use of the card and we finally required dispatchers to O. K. permissive cards in the same manner as train orders, using a letter to designate the card, however, instead of a number. The dispatcher is required to make a record of each card issued on a special form and state why the train was moved permissively. This report comes to the superintendent daily and enables him to check dispatchers who

* A paper by C. A. Goodnow, Superintendent C. M. & St. P. Ry., read at the meeting of the Western Railway Club, Chicago, March 19.

† This apparatus was described in the *Railroad Gazette* of Jan. 17, 1890.

are using permissive block to freely. We have at some points a permissive arm attached to the signal post under the permissive arm. These signals are located at the foot of long heavy grades where it is necessary for trains to get a run in order to get over the hill. The dispatcher allows a second train to follow after the first train has been gone 10 minutes or more. The permissive arm permits the train to proceed without stopping for a permissive card. In the territory with which I am familiar we have had but one rear collision due to permissive blocking and that occurred in a yard and the damage was very slight.

Our system is designed to prevent opposing trains, as well as trains running in the same direction from being in the block together. To prevent opposing trains from entering the block at the same time, the operator is required, before allowing a train moving in a specified direction to proceed, to notify the station in advance and obtain an acknowledgment from him that he will hold any opposing train which may arrive. This precaution—and so far as I know it is not used elsewhere—has saved us more than one wreck. We regard it as very important, and the rule is rigidly enforced.

We believe it to be important for the operator when it is proper for a train to proceed without stopping, to clear the signal in view of the approaching engineer and while he is far enough away so that he can maintain his speed. It is not always possible to do this owing to the location of some stations, but wherever it can be we require it to be done.

The closing of block signal offices for the night, their opening in the morning, and the meeting of trains at closed stations, present some complications which have been differently met on the several divisions. The practice, however, is now pretty well settled to require the operator before closing his office to know that the block both sides of him is clear, and to have permission from the Dispatcher to close and to receive acknowledgment of his good night from stations on both sides. He then cuts the block signal wire through and pulls his signal to clear, leaving the lamp burning. On opening the office in the morning he places his signals at danger, notifies the Dispatcher that he is on duty and ascertains from the stations on each side whether there is a train in the block. If there is, its time is entered on the block sheet, but before he allows it to pass his station he must obtain direct permission from the train dispatcher to do so. We do not regard it as good practice to have a stated hour for closing and opening block signal or train order offices. Trains may be delayed, making it necessary to keep the office open, or a wreck or other emergency may require the use of the signal within the hours when the office is announced to be closed.

The meeting of trains at a closed station is not quite so simple as the losing of the office. As the block signal is used to protect opposing trains it is obvious that a train cannot be given a train when another train has been assigned at the opposite end of the block, without infringing the rules. A permissive card cannot be used because permissive blocking only relates to trains moving in the same direction. We, therefore, do not allow a train to go to a closed station to be met or passed by another train without orders even though its time card rights permit it to do so. These orders are issued to both trains at the nearest open stations each side of the closed station. The signals remain at danger and a clearance is issued against them which states that the block is clear except as shown in the orders just received. This method is a bit clumsy, but as we do not close blocks where the condition referred to is likely to often occur, the safety of the arrangement and the importance of not varying from the proper practice outweigh all other considerations.

With us the block signal system does not modify the rules relating to train movement by telegraph in any particular, but for two or three years past some of our divisions where there is block working have had a special rule on the face of the time table permitting freight trains to pass and run ahead of other freight trains without orders. This has worked so well that other divisions have recently adopted the rule. Nothing that we have done has so largely reduced the number of train orders as this special rule. On a busy division where there is considerable local business or numerous junction points "Pass and run ahead" orders are usually quite numerous and as it is often difficult to figure where the slow train can be passed by the fast train with the least delay to both trains, frequent changes in orders are necessary and it presents one of the most unsatisfactory problems a dispatcher has to deal with. As now worked the block operators arrange for getting trains by each other (the dispatcher simply telling them what he wishes done) the trains being governed by the block signal. It is difficult to obtain reliable data as to the saving in orders effected by the rule referred to in conjunction with, and made possible by, the block signals, but I believe it to be fully 10 per cent. on those divisions where it was originally adopted. I know that it has run as high as 33 per cent. in some instances.

The examination of operators employed for block signal service is given careful attention. They are required to answer a large number of questions covering every detail and conceivable condition likely to arise in their operation and train masters frequently visit the offices in their territory to see that records are properly kept and that operators are obeying the instructions. We find that the price of maintaining a successful block signal system is "eternally keeping after them."

New York Central Track Elevation on Park Avenue.

The work of elevating the four tracks of the New York Central, along Park avenue, New York, from 106th street north to the Harlem river, and of building the new four-track swing bridge over the Harlem, is being rapidly completed. Heretofore, the tracks have been carried on a masonry viaduct up to 115th street, from 98th street, and thence in a walled cut to a point near the river. From here there is practically level ground to the old bridge over the Harlem. The change of grade from that of the existing stone viaduct begins at 106th street. Masonry has been added to the present structure, so as to cause its grade to ascend from 106th street north, just as much as it had previously descended; that is, 0.75 per cent. The stone work will continue to the south side of 111th street; near the south side of 110th street the ironwork begins, the girders being carried on short posts resting on the existing stone work, to 111th street. The plans originally contemplated retaining the old masonry work all the way up to 115th street, using short posts, as above. This will not now be done. The masonry of the viaduct has been cut away above 111th

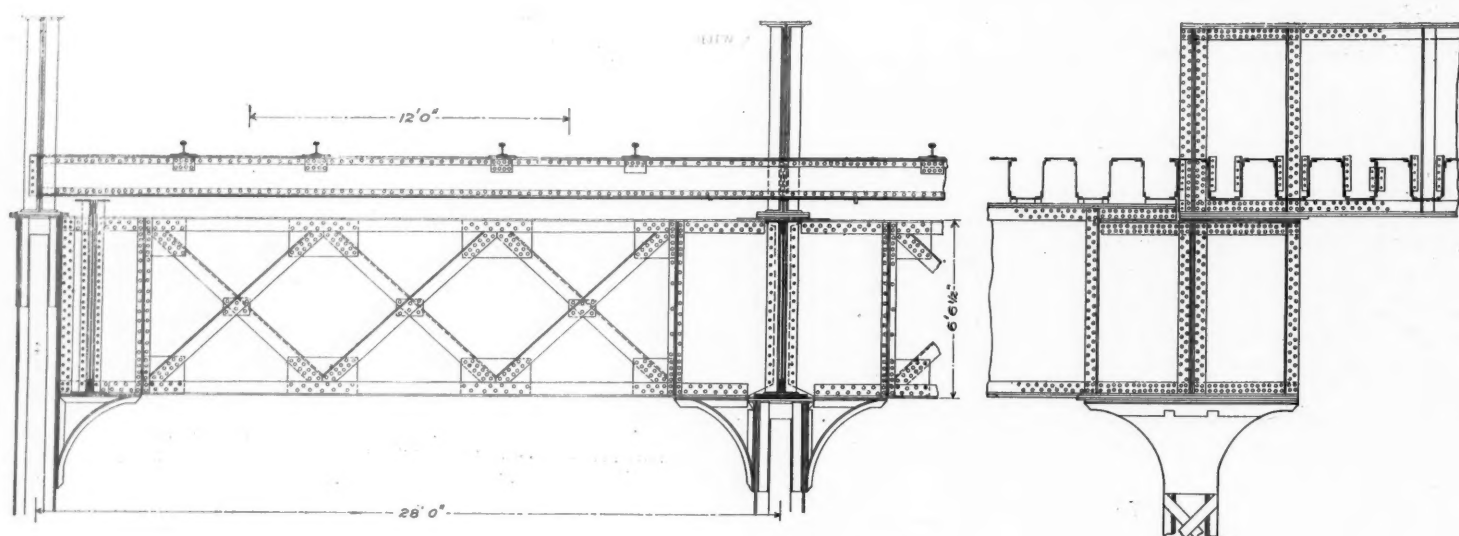


Fig. 1.—Joining of Deck and Through Girders.

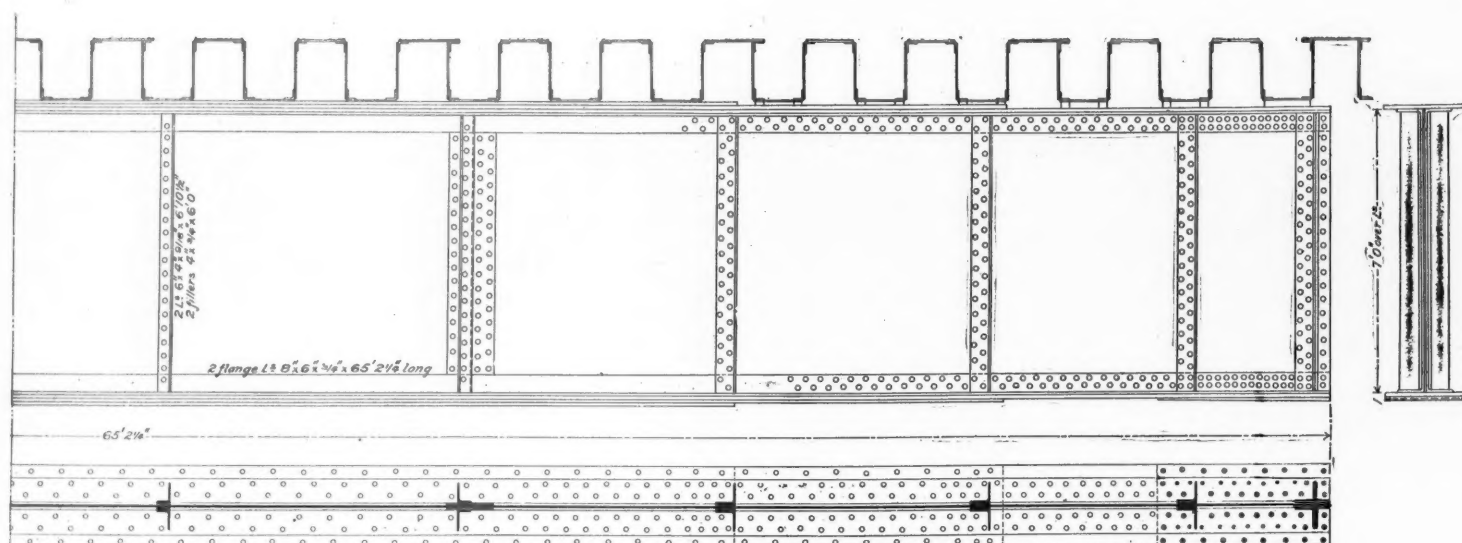


Fig. 2.—Details of a Center Girder.

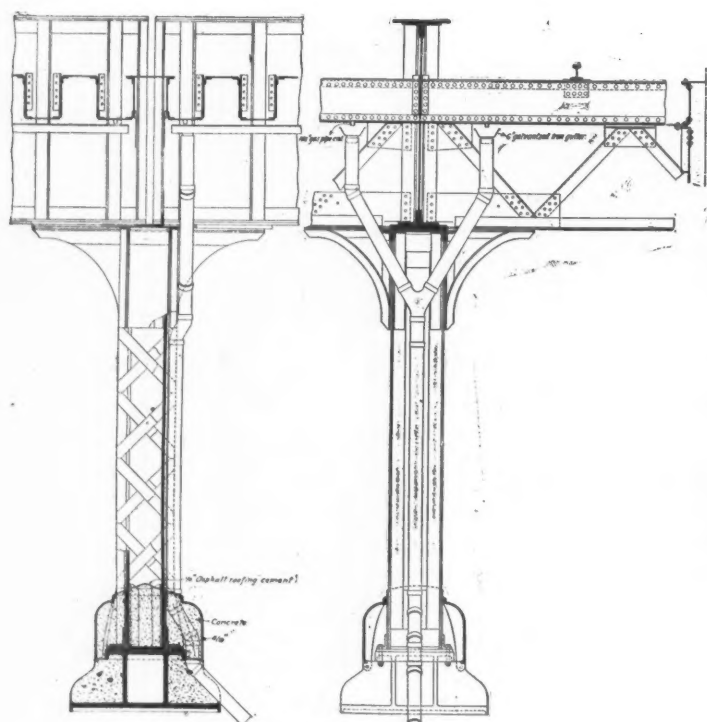


Fig. 3.—Columns, Showing Drainage Pipes and Wheel Guard.

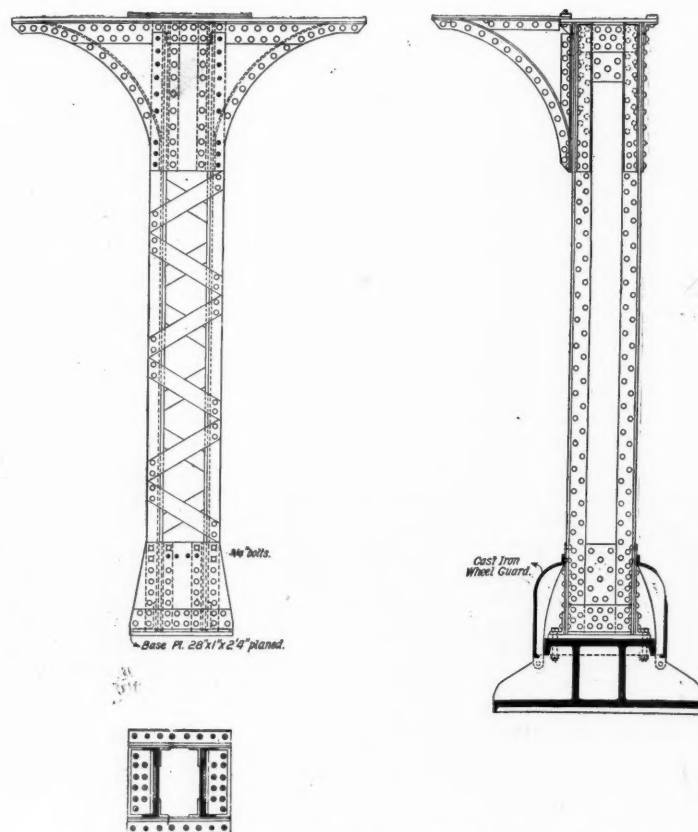


Fig. 4.—Details of Side Column and Base Casting.

street, at points where posts are to be placed, down to the street level, and the foundations for these posts are now being laid. This is between 111th and 115th streets.

It was imperative that the work should go on without interruption to the heavy traffic of the railroad, and to allow trains to be run regularly without loss of time, a timber trestle has been built along both sides of the viaduct, two tracks being car-

ried on each side. On these tracks all the trains out of Forty-second street station are now being run. The point at which this trestle joins the viaduct is shown in the engraving Fig. 7, together with the crossing of the viaduct at 106th street. As will be seen, the trestle bents come out to the curb line, occupying, with the masonry work, the entire width of Park avenue. This temporary trestle ends between 113th and 114th streets, at which point it rejoins the grade of the existing cut. This cut is now being used for train service, and will be so used until the elevated structure is sufficiently finished to allow trains to be run over it. It will then be filled in and paved over, the entire width of the street beneath the structure thus being left free for wagon traffic. Before this is done, however, the piers for the center posts of the elevated structure must be built. They cannot be built now without interrupting traffic in the cut, and the center line of girders of the structure will have to be supported upon heavy false work trusses, until trains are no longer run in the cut, and the piers can be built. From 113th street, north, the cut is now spanned at frequent intervals by these heavy wooden trusses.

The foundations for the side posts have been put in place by cutting down through the retaining side walls of the cut. The base of these foundations is of concrete, with a pyramidal brick pier upon it, supporting the base castings of the posts. The pedestals for the center columns will be of brick, with concrete foundations, and, where it is thought necessary, sub-foundations of piling will be put in. The base castings for the side columns weigh about 2,800 lbs., and those for the center columns 4,600 lbs.

One of the most interesting features of the work is the traveler used on the north end of the structure. Its legs span the open cut, having a distance of about 74 ft. between their extremities. Each leg is supported on a four-wheeled truck running on a temporary small-gage track, placed in the street on either side of the present cut. A hoisting engine is employed to move the traveler, being connected to the lower ends of its legs. The two pairs of legs are each united by a pair of plate girders 6 ft. deep, and placed 3 ft. apart. These girders are about 37 ft. from the ground and are held together by cross bracing. On the tops of each pair of girders run two crabs, by which pieces of material are moved across the cut into place, either by hand, or by steam power, in the case of heavier pieces. There is no bracing between each pair of girders, except at the extreme ends, in order that space may be left between them for these crabs. This traveler will erect about one span a day.

On that portion of the structure being built by the New Jersey Steel and Iron Company, a traveler moving on the completed structure is employed. This traveler is well shown in the accompanying engraving, Fig. 5, which is a view, looking south, of the traveler at work on the structure near 125th street, at which point, as is seen, the structure is very wide, to allow room for a sta-

tion. This engraving shows the construction of the temporary trusses for supporting the girders during erection. The traveler is a heavy one, with three derricks on the forward side. This engraving also shows the buckle-plate flooring. Below is seen a portion of the coping and railing of the cut. Some of this has been cut away to make room for the foundation of a post.

Fig. 6 is a view of the structure looking north from

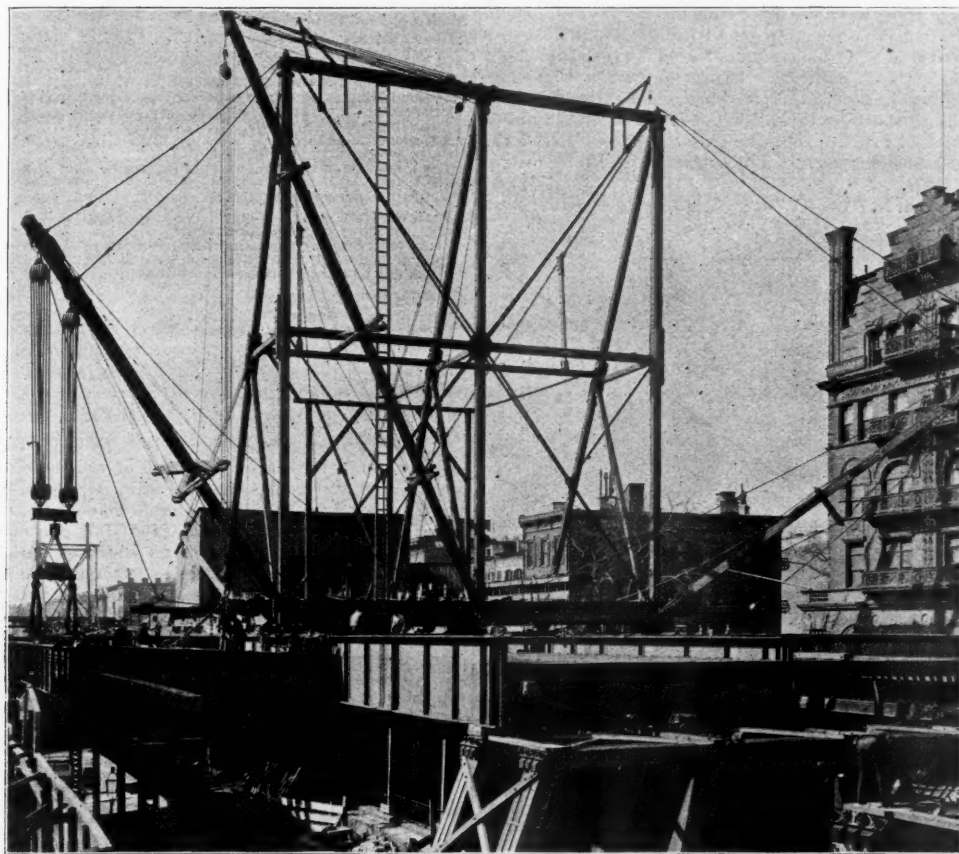


Fig. 5.—New Jersey Steel and Iron Company's Traveler Near 125th Street, Park Avenue, Looking South.

122d street, showing the false-work trusses, the widening of the structure for the 125th street station, and a smaller system of derricks used in erection at this point of the work. This latter is also shown in the background in Fig. 5.

The viaduct is built on steel posts, and the girders are part deck and part through, the southern or deck portion of the structure, meeting the northern or through

upper chords of the girders in the deck spans. The ends, in the latter case, are faced up with a plate and angles. The rails are fastened by rail bolts to rail plates placed directly upon the flooring.

The center girders are somewhat heavier than the side girders, having webs $\frac{3}{8}$ in. thick, while the side girder webs are only $\frac{1}{2}$ in. thick. They are all 7 ft. deep, out to out of angles, and are 24 in. wide for the center, and 20 in. wide for the side girders. These spans are about 65 ft., though varying from this somewhat in many cases. In the cross-section, Fig. 1, the cross-bracing for the deck girders is well shown, as is also the method of supporting the girders upon the center and side columns. Fig. 2 shows a detail drawing of one of the center girders. Fig. 3 gives two views of a center post with arrangement of the 4-in. wrought iron drainage pipes, and of the galvanized iron gutters. These drainage pipes will be connected with the sewer pipes. This figure also shows the $\frac{3}{4}$ -in. cast iron wheel guard, with its rust proof coating of asphalt, and filling of concrete. The buckle plates will first be filled in with asphalt for a few inches, and then with some sound deadening material.

Fig. 4 shows details of a side column, which, unlike the center columns, has only three bracket arms instead of four. The columns are placed about 28 ft. c. to c. and are of rectangular section. For columns over 12 ft. in length, two webs, 18 in. \times $\frac{3}{4}$ in. are used, with four $5 \times 3\frac{1}{2} \times \frac{3}{8}$ in. angles and $\frac{3}{8}$ in. lattice bars. The center columns are heavier, with $21\frac{1}{2} \times \frac{3}{8}$ in. web plates, $6 \times 4 \times \frac{3}{4}$ in. angles, and lattice bars $4\frac{1}{2} \times \frac{3}{8}$ in.

Open hearth steel has been used with an ultimate tensile strength of between 58,000 and 65,000 lbs. The elongation is 24 per cent. in 8 in.

The four-track swing bridge over the Harlem River is not so far advanced as the viaduct, but work on the foundations is going ahead rapidly. On the south side of the river a very fine piece of work is being done in the construction of the foundation for the south abutment. This abutment is a hollow quadrilateral, consisting of a northerly and southerly part, connected by flanking walls. The face of the abutment is 86 ft. $3\frac{1}{4}$ ins. The flanking walls at the northern part of the abutment are pierced by arches of 30-ft. span. Below the grade level of Exterior street the abutment is in two parts, connected by an arch of 17-ft. span. In all, the four parts of this abutment rest upon three caissons and a pile foundation. One of these caissons, 46 \times 24 ft., has been sunk and its air chamber filled in. A second, 20 ft. \times 50 ft., is being sunk. The caisson to sustain the pier between the two arches in the easterly flanking walls is 22 \times 27 ft. It is built, but has not yet been sunk. The fourth foundation will be built on piles, and the work of driving them is now going on.

The center pier of the bridge, that used for the pivot pier of the draw span, rests upon a pile foundation, about 700 piles being driven to an average depth of —54 ft. below mean high water. These piles are of long leaf southern pine, or spruce, 14 in. thick at the butt when cut off, and 8 in. at the smaller end.



Fig. 7.—Viaduct Crossing at 106th Street, Park Avenue, Showing Temporary Trestle.

portion at 115th street. We show in Fig. 1 a joint between through and deck center girders, showing how the buckle-plate flooring is carried from one to the other. There are no cross girders, the entire flooring for both through and deck girders being built up of plates and angles. These buckle-plates are riveted to the webs of the girders in the through span and rest directly on the

They were driven, without shoes, by a 4,000 lb concave faced hammer, and the specifications required a penetration of not more than 25 in. in the last 20 blows or more, than $1\frac{1}{4}$ in. in the last blow. They were cut off at —32 $\frac{1}{4}$ ft. by a machine circular saw. Some of these piles were as long as 80 ft., and in this case the allowed minimum diameter of the smaller end was 6 in. The

minimum length of piles was 60 ft. About 11 tons per pile was allowed in this pier, and the piles were driven 2 ft. 6 in. c. to c. The bottom was dredged out to a depth of 36 ft. 6 in., and after the piles were driven and cut off, about 1,200 cu. yds. of concrete was placed about their heads to keep them in place and preserve them. This filling came up to about 32 ft. 6 in., below mean high water, that is, to the heads of the piles. A grillage of 12 x 12 in. Pennsylvania white hemlock is placed on the heads of the piles. This grillage is 6½ ft. thick. Riprapping extends about the heads of the piles and the lower part of the foundation, sloping down to the bottom of the river from a point 20 ft. below its surface. The bottom diameter of the pier is 65 ft. It is built of rock-faced ashlar, and the masonry is annular in form, with six radial walls connecting the outer ring with the center. The inner face of the wall is stepped, and its bottom thickness is 16 ft.

The New York Central trains cross the Harlem at

found suitable for signal lamps because it is so much like the ordinary "white." The Chicago & Northwestern combination of red and green seems to satisfy him little if any better. Such a combination lamp was tried in England some time ago but met with little favor. Mr. Sperry has not been able to get any red wire-glass. He is now using semaphore castings with an elongated opening for the colored glass, so as to make sure that the clear light will not be exposed, so as to give a false indication, when the arm, supposed to be standing in the danger position, droops a little, so as to lift the colored glass. With a circular glass in the casing, a slight change in the position of the arm may allow the white light to be seen beneath the spectacle and the white will absorb the green rays. Enginemen have actually been misled by such an occurrence. Mr. Sperry urged the more general protection of isolated switches by distant signals.

Mr. J. N. BARR (C., M. & St. P.), being asked to speak,

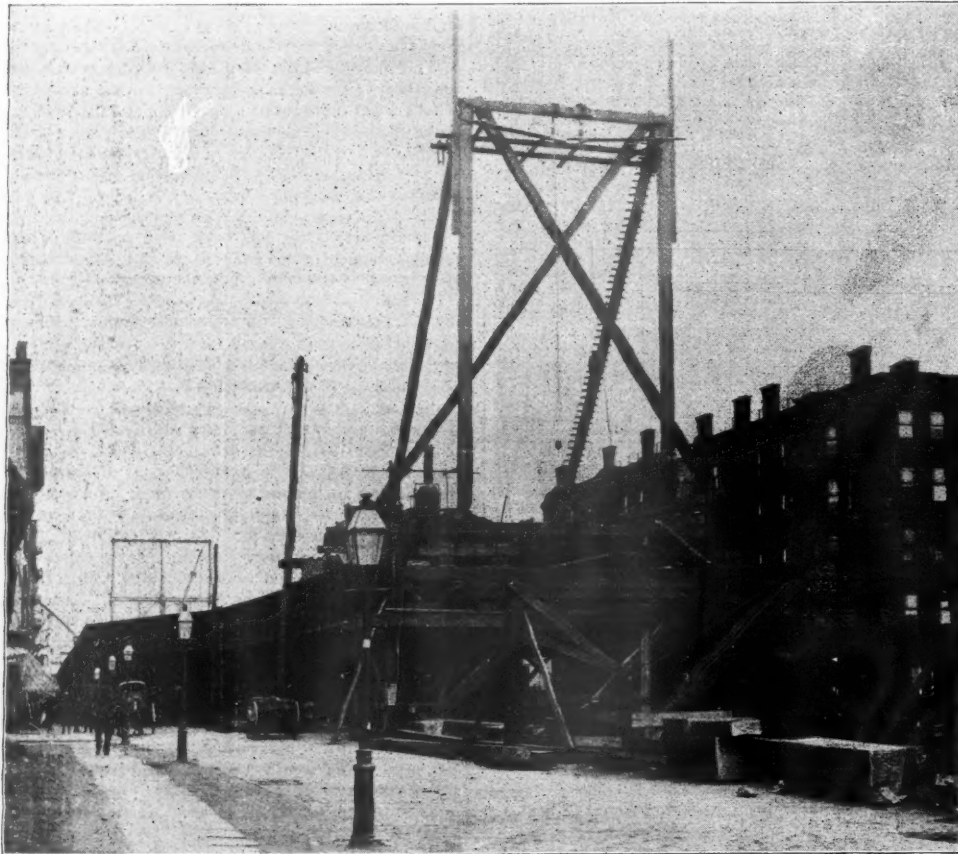


Fig. 6.—Looking North from 122d Street, Showing Widening of Structure for 125th Street Station.

present upon a double-track lift bridge, which was built for temporary use when the old draw was removed. (See *Railroad Gazette*, June 10, 1892.) It is expected that the work will be so far completed by the beginning of next year that trains can be run over the new bridge and the viaduct.

We are indebted to Colonel Katté, Chief Engineer, and to Mr. Boulard, Resident Engineer, of the New York Central, for the drawings, and much of the information used in this article.

Discussion on Signaling at the Western Railway Club.

At the meeting of the Western Railway Club in Chicago, on March 19, the first subject for discussion was the paper on signaling, read by Mr. George Gibbs at the previous meeting. The discussion was opened by Mr. DELANO (C., B. & Q.), who referred to inconsistencies in the use of semaphore signals with fish-tail ends. On some roads, said the speaker (meaning, we suppose, the C., B. & Q.) such a blade is placed on the same post with an ordinary home signal blade, and the home being clear and the caution blade horizontal, the indication is that the train may proceed under control; but this generally comes to mean very little, as nine times out of ten the preceding train is so far ahead that the engineman never overtakes it and so gets into the habit of running at full speed. Then the use of the same kind of arm (at interlockings) for a distant signal is made meaningless by the habit many signalmen have of never clearing the distant signal. One such signal in Chicago is understood not to have been cleared for several years. Mr. Delano favors the introduction of apparatus, with a track circuit between the home and distant signals, by which the distant signal will always go to all-clear when the home is pulled off, the track circuit being arranged to throw the distant "on" when a train passes it. If the distant signal is not used, enginemen will get into the habit of taking the chances of finding the home signal at clear.

Mr. P. H. PECK (C. & W. I.) has 808 signals with two very large interlocking plants, one of 105 levers and the other 134. He thinks white should not be used as an all-clear night signal.

Mr. H. M. SPERRY (National S. & S. Co.) agreed with Mr. Delano as to the lack of discipline in the use of distant signals. He thinks amber-colored glass will not be

said he was ignorant and expected to be sat down upon, but he would venture to say that signal men made altogether too much fuss about the use of red paint on structures near the track. He thought also that the principle that "no signal" means safety might not be fallacious, because he found men of experience somewhat evenly divided for and against it.

At this stage of the discussion Mr. C. A. GOODNOW (C., M. & St. P.) read a paper on the operation of the block system on his road, which will be found in another column.*

Mr. JOHN FULTZ (C., M. & St. P.), a locomotive engineer, warmly praised the block system as used on his road. He prefers a green light for all-clear.

Mr. W. B. TURNER (C. & W. I.) spoke of the necessity of uniformity in locating signals and advocated the more extensive use of signal bridges.

Mr. E. C. CARTER (C. & N. W.) brought up the question whether a separate signal should be used for train orders where the block system is used. On one road during the last two years there have been two collisions in consequence of the operator pulling off the block signal on the approach of a train, forgetting that he had orders.

Mr. GOODNOW, referring to a statement in the paper read by him, said that on one division of his road two signals were used and on another only one, and the latter proved the most satisfactory. Where there are two signals, the engineman has to look in two places and is liable to rely upon one signal more than on the other, especially if one signal be a conspicuous semaphore and the other a disc, like the Swift signal. He had never had a failure during the four years since the separate train-order signals were abandoned. He has no device connected with the signal to remind the operator that he has train orders on hand.

Mr. G. N. BASFORD, of the *Railway Review*, read a paper advocating the use of amber-colored glass for a third night signal. He presented the well-known arguments against a combination of red and green and said that he had found by experiment that amber was sufficiently distinctive at 1,000 ft. Mr. Gillingham and Mr. Quereau had made experiments confirming his views.

Mr. W. J. GILLINGHAM (Illinois Central) read a paper chiefly devoted to automatic signaling. He gave the following figures, presumably from his road, showing

the failures in one year on 128 (Hall) signals which were operated 4,793,184 times.

Failures of Apparatus:

Broken battery jar.....	14
" wire in hand key box.....	1
" wire in battery house.....	1
" wire in ground trunking.....	1
" bond wire.....	7
" fuse wire in lightning arrester.....	3
Defective signal cases (snow).....	2
	30

Neglect Signal Maintenance:

Heavy battery, newly set up.....	4
Frozen battery in house.....	1
Loose battery connections.....	2
Loose switch instrument.....	2
Loose binding posts in relays.....	3
Dirty points in relays.....	4
Adjustment bad in relays.....	7
Adjustment bad in signals.....	2
Battery men in battery house.....	1
Track insulation worn out and not replaced.....	2
	27

Roadway Department Neglect:

Board wire cut by section men.....	6
Boot leg wires cut by section men.....	1
Plugs forced out by changing ties.....	6
Section men using iron track gage.....	1
Track down on interlocking connections.....	9
	23

Sundries:

Frost on relay points.....	1
Derailment bending switch connection.....	5
Cross in signal wires.....	1
Expansion, rail cut out end posts.....	1
Feed wires maliciously cut.....	1
Unknown.....	1
	10
Total for year.....	90

The maintenance of these signals is controlled by three inspectors and four battery men, two of the inspectors having each 42 signals, and the third 44, under his charge. Each battery man has charge of about 435 cells.

Mr. CARTER, being asked about the Hall automatic signals on his road, could give no statistics, but said they had given the most perfect satisfaction. He had expected that enginemen would disregard the rule requiring a full stop when a signal was out of order, but a very careful watch showed that this was a groundless fear. Referring to discussions on block signaling in the committee meetings of the American Railway Association, he said that facts there brought out showed that members are rapidly coming to appreciate the importance of block signaling, and are putting the system into use.

Mr. E. D. WILEMAN (L. S. & M. S.) read a paper advocating the use of white lights for danger, green for caution and red for safety.

Mr. GIBBS explained that in his paper presented at the previous meeting, he did not intend to say that the manual block system superseded the work of the train dispatcher, but that it left him nothing to do but arrange meeting points.

Contributions were received in writing from Mr. A. T. Dice (Atlantic City Railroad) and Mr. A. H. Rudd (N. Y., N. H. & H.). Mr. Dice says that the locomotive runners on the New York Central between New York and Albany, which is now the most completely signaled division in America, are enthusiastic in praise of fixed signals. One of the most intelligent runners said he would as soon part with his air brake as with the block signals. Speaking of the manual controlled system, Mr. Dice says that it is successfully used on single track, between Tonawanda and North Tonawanda on the New York Central. Mr. Dice believes in automatic signals, but cannot agree with Mr. Gibbs in calling that system the acme of perfection. The manual controlled, with the track circuit, is the most perfect form.

Mr. Rudd spoke in commendation of the night signals of the Boston & Albany, which give a position indication. He referred to the great annoyance resulting from using red lights on dwarf signals. Such lights are a source of much anxiety to enginemen. Mr. Rudd advocates, for a night signal code: Red light on high signal, purple light on low signal, white light on any signal, and the absence of a light on any signal to mean danger; green light, caution, go slow; two vertical green lights clear, proceed. Mr. Rudd says that the Old Colony experienced many delays at grade crossings where a track circuit was used to lock all conflicting signals after the train had passed the distant signal. On Mr. Rudd's division there are 93 Hall signals, mostly operated by track instruments, and in the last 15 days he had had only five failures. These signals are maintained by six men.

Mr. Goodnow's paper on the train staff system was read by title only. He opened with a sketch of the staff as used in England.* For several years before the use of the staff on the Savanna bridge (on the C., M. & St. P.) trains were run over the bridge by the use of cards, which were practically the same as the staff, except that cards could not be interlocked or properly safeguarded. Referring to the merits of the system Mr. Goodnow said:

With this system, from the brief description I have given, it is clear that the bridge dispatcher has no responsibility, except to give the proper trains the preference. He may delay traffic, but he cannot create a condition of danger. It is not necessary for him to provide for a proposed or supposed movement of trains by sending numerous orders, only to find it necessary to cancel them, because the train cannot move as expected. He is in touch with the yardmaster at Savanna and with the dispatchers of both divisions, and through these sources is fully informed in regard to the probable movement of trains in both directions. He may have expected to hold a freight train for a passenger train, which is reported on time at some distant station, only to find that the passenger train has lost time and that he can just

* The Webb & Thompson staff apparatus was described in the *Railroad Gazette* of Aug. 1, 1890, and its installation on the Chicago, Milwaukee & St. Paul in the issues of May 4 and Sept. 14, 1894.

*See page 229.

squeeze the freight train into the terminus. There is no necessity for sending hurried orders with attendant possibility of error. He simply signals for a staff, and in five seconds or less the engineer has his authority to go forward. Or supposing the situation reversed. A passenger train reported late has made up so much time that another train which is approaching, and for which a staff has been drawn, cannot go forward. Transportation men know the delay which results when it is necessary to change or make telegraph orders void. No such delay occurs with the staff system. It is only necessary to leave the signal at danger; replace the staff in the instrument (enabling one to be withdrawn at the other end of the block), and the passenger train goes forward with no loss of time. In case of so great a delay to a train, to which a staff has been delivered, that it is desirable to recall its permission to move, the staff is brought back to the office and replaced in the instrument, thereby cancelling its authority to proceed, in a manner which cannot be misunderstood.

When a work train is to occupy the block the delivery of a staff means that it is to be protected in both directions, and that no flagman need be sent out, making a delay to 50 or 100 men while he comes in.

Mr. Goodnow's paper gives a detailed mechanical description, with drawings, and also the code of rules and telegraphic symbols used.

The "Universal" Freight Car Adjuster.

The "Universal" freight car slack adjuster, manufactured by Messrs. Pratt & Letchworth, of Buffalo, illustrated above, is the first successful introduction of a new principal in the art of adjusting the slack of the air brake rigging. The work is accomplished by the brake's forward motion only. The adjuster consists simply of an eccentric placed in a recess prepared for it in the brakehead, and coupled up to the opposite brakebeam as shown in Fig. 1, where *A A* are ordinary Christie breakheads having the usual recess somewhat enlarged and made circular to receive eccentrics *C C*. The brakebeams

are to be issued for its use. It adjusts itself upon each application of the brakes. Slack caused by wear of axle boxes, pedestals, pins, rigging or springing brakebeams, cannot cause trouble with the adjuster. It cannot "hold up" brakes. It allows the shoes to hang clear of the wheels. It does not interfere with any of the rods or levers or change their working angles. Dust, snow or ice has no effect upon its operation. It is absolutely independent of all springs, either "relief" or otherwise. In four months' trial the piston travel has not exceeded $\frac{6}{16}$ in. It is applicable to either "inside" or "outside" brakes. It never needs attention when putting on new shoes, being completely automatic. This latter feature makes it pre-eminently a freight car adjuster. All other adjusters on the market need to be "put back" by hand when shoes are renewed or there is trouble with the brakes; but the car with this adjuster upon it may be safely committed to strange hands with the certainty that so long as any shoe metal remains the piston can never reach the end of the cylinder and there will be a good and efficient brake. It will not be put out of order no matter who may renew the shoes. Such qualifications have never before been possessed by any adjuster.

Below is given the opinion of a Superintendent of Motive Power who is well-known to the railroad world, and under whose direct supervision the test was made, and who is willing to give further information to those that may require it, if they will apply through the *Railroad Gazette*. He says: "We have had one of the 'Universal' freight car adjusters on our car 6036 for the past four months, during which time it has made 15,080 miles under the most severe tests of snow storms and low temperatures. This car is fitted with Fox pressed steel trucks and inside brakes upon which the device has given complete satisfaction. The initial piston travel

view down the lead, and track surface and surroundings should be kept clear for yardmen to get on and off, or to couple and uncouple moving cars without danger of stumbling. This will save time, labor, car damage, track maintenance, and, most important, injured employees. A large yard should have a man constantly employed to keep tracks clear of coal, stone, etc., and to gather up and place on separate scrap piles the numerous pieces of car equipment, broken links, pins, etc., with view of economy and to avoid personal injury. The car department iron. When taken to repair track, will effect a neat saving each week; and, with link and pin iron at $1\frac{1}{2}$ cents per pound, a quick-working convenient blacksmith can straighten numerous links. The expense for coupling iron seems to increase from month to month, and will, no doubt, until Jan. 1, 1898, when Congress hopes to eliminate from our personal injury records the too common entry, "caught coupling."

To avoid delay waiting for power, the engine coal, sand and water supplies, and also the cinder pit, should be conveniently arranged for handling, "first in, first out." The yardmaster's and timekeeper's offices and the supply room should be near by; and the assistants' cabins, in several different parts of yard, should communicate with main yard office by means of wire for emergency moves required so often. When several deliveries are made from one end of yard through main leads, electric push button lines from ranging yard to throat leads will oftentimes prevent starting a delivery that might block several movements, and at the same time permit some other equally important drag to be got out. Electric light at reasonable figures, for yard illumination, will soon repay a company requiring prompt night movements, by a saving in car repairs, besides reducing loss from theft if yard watchmen do their full duty.

The tool car should be centrally assigned on wreck track, which should not be long enough to hold other cars. Yardmen's cabins conveniently located, heated in winter and provided with benches for rest after lunch, and lockers for street dress, lunch baskets, rubber suits and lanterns, attract the better class of employees and produce good results. All frogs, guard and switch rails should be securely blocked, and the blocking at all times kept in good condition. There is less danger without blocking frogs and guard rails than with improper or worn-out blocking. Hard timber, made to conform to shape of rail side, fitting against web, extending to outer edge of head and base of rail, and securely bolted to rail to prevent displacement by passing trains, is a good safeguard for yardmen.

In the confusion of the numerous city lights, yard employees' lanterns and yard clerks' bull's-eyes, so often used to get correct car marking, white switch lights cannot be easily distinguished in a yard; and there is possibility of red lens being broken, so let the standard rule read red, white, or no light as indicating danger, and green for safety. To coach all new yard employees, the track numbers painted on switch stands or blades is a little money well spent. A man with whom all switchmen before quitting the yard can leave lanterns to be cleaned or filled, or an isolated fire-proof cabin in which yardmen can fill and care for their own lanterns, is an economical provision. All lanterns, switch keys and other railroad property issued to yard employees ought to be receipted for, and losses made good to the company.

It is just as important for a yardmaster to be a good judge of men as it is to be thoroughly familiar with the manner of handling cars. Take great care in selecting yard switchmen. Each applicant should fill out prescribed form, and sign understanding as to non-clearance points, etc., describe family connection, and give correct address of relatives for communication in case of personal injury. After putting switchmen to work, yardmasters should, by close observation, locate each man regularly with crew in position best suiting his ability. When many crews are worked in a terminal yard, the proper placing of men is quite an item. Some foremen will make two deliveries to another's one, and yet the slow man can switch twice as many cars as the other. Some switchmen are natural pin pullers and poor couplers; others make every coupling, but have no knack at pins when cars are moving; and, in pole switching, a good pole man may not be a success at links and pins. Yardmasters too often leave the selection to foremen. Railroad companies handicapping yardmasters with switchmen's contracts or agreements, providing seniority, etc., cannot get the best results. Let every man work on his own merits, treat all employees fairly, and do by them as you would be done by. Give older men in service preference if record and ability justify; but seniority pure and simple, will eventually cripple any yard. Men in all grades are encouraged by mention of their good work or specially commendable acts, and record of all such should be placed opposite each yardman's name, same as his shortcomings. I am a firm believer in a graduated scale of pay, depending upon length of service and ability, but as rate schedules are generally uniform, a money or other consideration could occasionally be made, and such money, when properly placed, is well invested. Good yardmen are valuable employees. If there is such a thing as "cream of switching talent," any company, with kind treatment, care for men's safety, and well-regulated yards, can secure and retain it.

Liquor and yard switching do not mix, and for the safety of fellow-employees, not considering property damage, any yardman violating rules relating to intoxicating liquors should be dismissed from service at once; but it is the duty of yardmasters, superintendents and the higher officials to set the right example.

All yard employees should be cautioned against giving hand or lamp signals in a careless or uncertain manner, and held to a strict accountability for such work. What is known among yardmen as the Chicago switch movement (requiring an engine to come to full stop before yardman steps off footboard to throw switch) does not exist in yards well managed. Yard schedules figured on rate of pay per hour enable all employees to know amount due from pay car and are in line with what State laws will eventually require.

A close watch on overtime invariably results in reduction. Foremen's written explanation for all such time, with approval of assistant yardmaster before going to timekeeper, often suggests improved handling for the day following. When several crews are employed and distant deliveries made over their own company's rails, a flag or marker signal by day, and a light signal by night, displayed on the engine working overtime, will permit foremen, switchtenders and others to expedite such signaled engines' movements, with view of early relief, if all concerned understand they are to be held to strict accountability for causing delay. Firemen on yard engines must understand that their duties require their undivided attention to signals passed on left side, when not engaged in feeding fire.

Absolute justice is essential to good discipline in handling any number of men. Mr. A. W. Dickinson, who had charge of the St. Louis Terminals several years ago, was a master in whom no confidence was ever misplaced, and who left no promise unfulfilled. During the

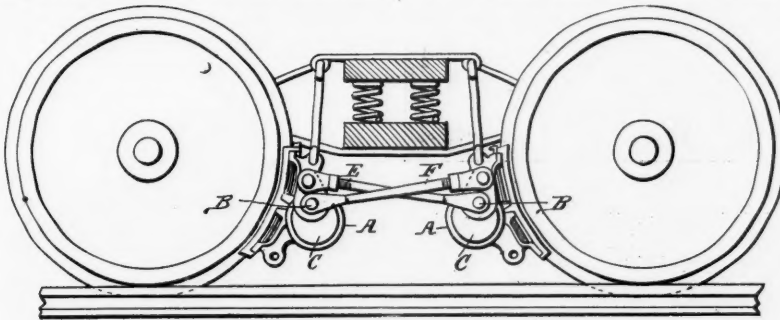


Fig. 1.—Inside Brakes.

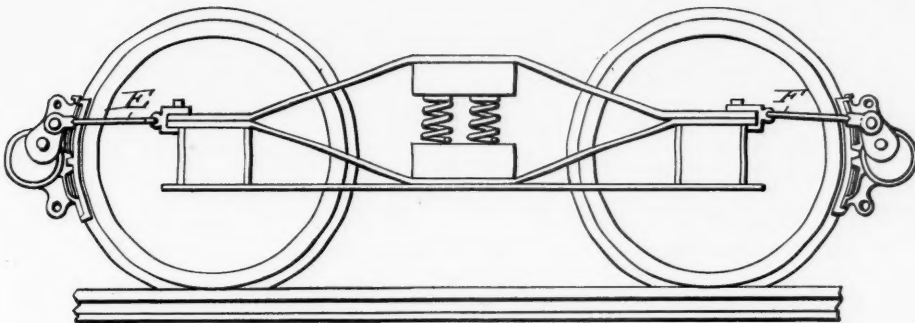


Fig. 2.—Outside Brakes.

come through the heads and through the eccentrics at *B B*, and are coupled by rods *E* and *F* to the opposite eccentrics. Thus any wear upon the shoes produces motion in the opposite eccentric which at once compensates it, and the piston travel is thereby restricted.

The application of the adjuster to "outside brakes" is shown in Fig. 2. The rod *E* is attached to the lug of the eccentric, and finds a fulcrum upon the pedestal or some convenient part of the truck frame. As the shoes approach the wheels the eccentric is turned and compensates for any wear upon the shoe.

Hitherto the adjusters that have appeared on the market have all been constructed on the principle of taking the slack out of the brake rigging by using the forward motion of the brakes to measure off the excess movement caused by wear of shoes; and as soon as the excess reaches a definite amount it is taken out by suitable means during the release or backward motion of the brakes. Consequently, all such adjusters become inoperative unless they get the back movement on the release, because it is during this movement that the actual work of adjustment is done. It has been ascertained by careful trial that very few parts of the brake rigging have any reliable backward motion. This is particularly the case upon freight cars. Owing to the "push bar" being detached from the piston head in the brake cylinder, there is no reliable backward motion anywhere about the brake rigging, and so long as this continues all adjusters at present in use on passenger cars are practically useless for freight service.

It was the knowledge of this fact that led Messrs. Pratt & Letchworth to seek for a freight car adjuster and in the introduction of the "Universal" adjuster they believe they have achieved success. A careful test of this adjuster in freight car service has demonstrated that it possesses valuable qualities as a freight car adjuster and overcomes all the old difficulties in the adjuster business. For instance: It is so simple that it requires no instruc-

was 4 in., with a new set of shoes, and every four or five days the piston travel was carefully measured, and has never exceeded $\frac{6}{16}$ in. During all the time the adjuster has neither received nor required the slightest attention, but has steadily done its work. Its simple and effective design is calculated to establish confidence in it, and from what I have seen of its practical work I am convinced that it is just what we need for taking up the slack."

From the fact that freight cars have no such trained staff to look after their brake equipment as passenger cars have, it seems that an adjuster is more needed on freight trains than on passenger trains, especially as a freight car is liable to be sent away from its parent line and remain away for months, and unless there is some such device upon it to take care of the slack the money expended in equipping it with air is of little service.

This adjuster is admirably adapted to gondola or hopper cars. Owing to the construction of these cars the brakes are usually cramped and it is difficult to find room for an adjuster, but wherever there is room for an ordinary brakehead there is room for this adjuster, in fact it appears to be universally applicable.

E. I.

Terminal Freight Yards.*

The terminal of a railroad system may be compared with the heart of the human body; it must be healthy, well regulated and capable of performing its full duty to a growing system under heavy pressure. Too often, the busiest terminal, because of its proximity to the general repair shop, is burdened with worn out engines, making it impossible to handle cars as business demands or to start trains on the dot.

Pole drilling should be employed when at all practicable, switch stands and night targets should permit full

* Paper read at the March meeting of St. Louis Superintendents' Association, by Mr. W. A. Garrett, Superintendent of the Terminal Railroad Association. [Condensed.]

from whom is not stated. The Commissioners must not order a costly crossing where it would serve only a few persons, and a railroad is not obliged to make a crossing in the winter.

Laws were passed regulating the management of grain warehouses at stations and prescribing the procedure for condemnation of sites for such warehouses. The law of 1890, empowering city councils to require flagmen at street crossings, was amended so as to require railroads to raise or lower tracks at crossings when necessary.

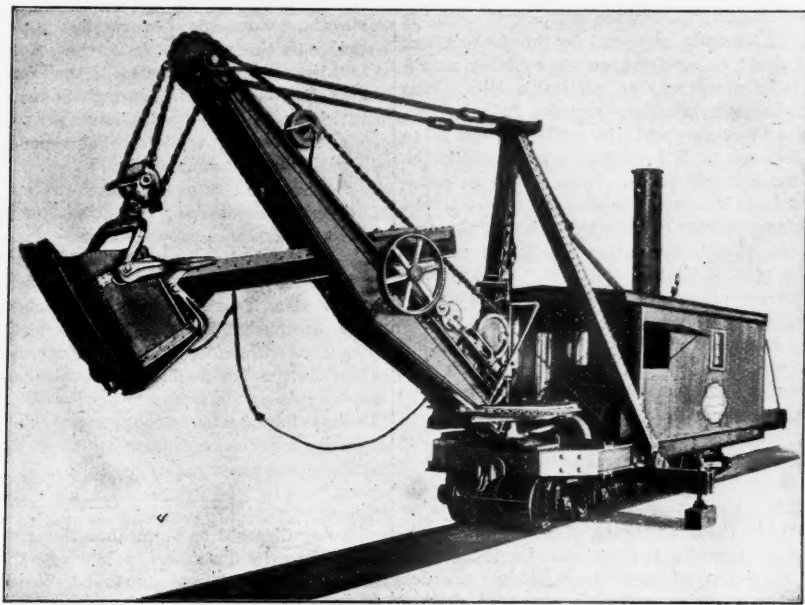
A bill of 12 sections, approved March 13, provides for the incorporation of telegraph companies.

Bucyrus Steam Shovels on the Chicago Drainage Canal.

There are 24 shovels of the above company's make in use upon the various sections of the Chicago Drainage Canal. Fourteen of these are of the boom pattern, and

In place of the usual wrought-iron side-arms and braces for attaching the dipper to the dipper handle, with their multiplicity of parts and connections, a solid cast-steel frame is employed. This frame is flanged to fit the dipper shell and the handle, and has eyes formed in it to receive the dipper bail and hinges; moreover, it is so designed that the lines of strain from the dipper handle and bail intersect in a point, and this point is close to, and in line with, the teeth. This concentrates all the strains on the upper part of the dipper and brings them in more direct lines. The lower part of the dipper then becomes simply a receptacle for material. The steel lip-plate extends over a large part of the interior surface of the shell, while the teeth are placed outside, where they may better take the wear. They do not require sharpening so frequently as ordinary steel teeth.

The through jack-beam, also a special feature of this shovel, is composed of two 15 in. steel I-beams, 18 ft. long. It makes a solid base for the "A" frame, which is



Bucyrus Special Contractors' Shovel.

10 are of the crane pattern. The shovels are distributed among the various sections as follows: Heidenreich & Co., 2; Ricker, Lee & Co., 4; Streeter & Kenefick, 2; E. D. Smith & Co., 3; Griffith & McDermott, 4; McArthur Bros., 4; Gualley Construction Co., 3; Sinclair Construction Co., 2; total, 24. Of the crane pattern the shovel used is the original standard railroad shovel as built by the Bucyrus Company. Its weight is 35 tons, and the engines are 8 x 12 in., double. It is not so heavy a shovel as those of the boom pattern, although the size of the engines and of the dipper is the same. The "A" frame and boom of the latter type of shovel are mounted on a very heavy car, and the parts are few and massive. One of these shovels in use on McArthur Bros.' section has made a record of the largest output of any shovel on that section, having loaded 1,530 cubic yards of gravel and boulders in 10 hours, the material having been measured in place.

Another very heavy type of shovel used is the No. 0, boom pattern, which is designed to be capable of working continuously up to its full power in very hard material. The size and strength of its parts make it practically unbreakable. They are proportioned to withstand the strains and concussions due to encountering immovable resistances with 100 lbs. of steam. This shovel weighs 52 tons. Upon Heidenreich & Co.'s section one of these shovels excavated during the 8 months from June 6, 1894 to Feb. 6, 1895, 276,400 cu. yds. measured in place. Although this shovel was working double shift, the cost for repairs during that entire time was only \$200. During the month of October 45,525 cu. yds. were excavated. Although having worked double shift and having had so small an amount spent upon it for repairs, this shovel is at present in good working order and is repeating its previous record.

The special contractors' shovel, of which we give an illustration, is the heaviest shovel of this company's make in use upon the canal, its weight being 60 tons.

This shovel was designed especially for the hard material on the Chicago Drainage Canal. The first one of the type, ordered by McArthur Bros., has proved so successful on their section of the canal that they have duplicated their order, and six more machines have since been sold for similar work. The distinguishing features of this shovel are: First, the high "A" frame, which is built up of steel channels and plates; second, the independent thrusting engines on the boom, which are of great power, capable of creating a thrust of 60,000 lbs. outward on the dipper when it is digging, which augments its digging power greatly. The angle of pitch of the dipper with its handle makes this thrust motion effective when entering the bank. Such motion is usually obtained by a friction clutch driven from the hoisting chain, a plan that absorbs much effective power from the main engines. In order to safely withstand the application of such a large amount of power, the boom, dipper handle and dipper are of unusual size and strength, being as heavy as are used in large lake dredges.

stepped upon it by heavy steel castings. All the principal castings throughout the machine are of steel. There are only 28,600 lbs. of cast iron in this shovel, the total weight of which is 125,000 lbs.

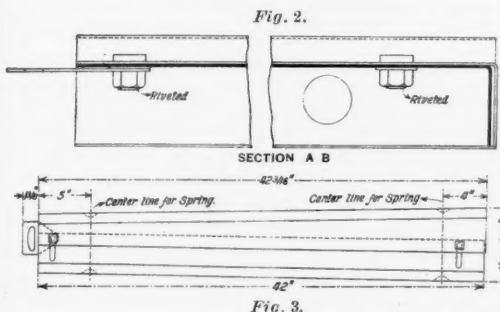
The engines have two cylinders, 10 in. x 14 in., and are of the usual standard pattern. The frictions are of the outside band type, those of the hoisting and swinging being interchangeable. This form is most satisfactory for continued hard work, being easy to handle and adjust, and not likely to heat.

The boiler is of the locomotive type and of unusually large size, so that ample steam capacity is obtained without forcing.

This machine is designated "Special Contractors' Shovel," because the height and width which it occupies when at work is beyond railroad limit. For railroad transportation it is necessary to dismount the high "A" frame and jack-beam. The latter fold up when not in use.

The work that these shovels have done on the Drainage Canal has been unusually difficult; in fact, the material, indurated clay, glacial drift and boulders, is harder and more expensive to excavate than solid rock. The boulders frequently occur as heavy as 5 to 15 tons, and it is such material as this for which the shovel is especially adapted.

On McArthur Bros.' section the general daily average for these shovels for the season was 594 cu. yds. per day



National Railroad Foot Guard.

of 10 hours, engineer's pit measurement, inclusive of all delays. For short periods this was greatly exceeded. If it seems like a small output for so large a machine it should be remembered that an average for the season includes all delays for repairs, waiting for cars, storms, etc., and is far more valuable to a contractor than statements of records for short times. Further, in this case, the material was measured in place, and not by the number of imperfectly filled cars of loosened earth.

All these shovels are made by the Bucyrus Steam Shovel and Dredge Co., of South Milwaukee, Wis.

Car Ferry between Peshtigo and South Chicago.

Two boats are now being built to carry loaded freight cars 260 miles; that is from Peshtigo, Wis., southward to South Chicago. They will be 316 ft. long, with 44 ft. beam and will each have a capacity of 28 freight cars (four tracks, seven cars each). These boats will be towed by tugs instead of having engines of their own. James Davidson, of West Bay City, Mich., is building them.

This long route connects the Wisconsin & Michigan Railroad with the lines running east from Chicago, and a round trip will be made every three days. At South Chicago the boats will connect directly with the Elgin, Joliet & Eastern or outer belt line, which can deliver cars to the Eastern roads, thus avoiding the crowded Chicago yards. Mr. John N. Faithorn, well known as a traffic man, is Secretary of the Wisconsin & Michigan Railway, and he estimates that freight from St. Paul can be delivered in South Chicago 24 hours sooner than if it were to go by rail all the way. The Wisconsin & Michigan Railway, however, is only about 50 miles long, and it must get its St. Paul freight from roads which have a strong interest in taking freight for the East over their own rails as far as possible. The Minneapolis, St. Paul & Sault Ste. Marie, the most favorable Western connection of the new line, desires to haul Minneapolis flour, for instance, as far East as the Sault, of course, which is about 200 miles east of the point where the Wisconsin & Michigan would like to get hold of it. For points in the Southern states the Soo line would be glad to get freight from St. Paul and vicinity, and give it to the new line, for it would get a haul of about 300 miles; but this is a pretty roundabout line; the distance is about 600 miles to Chicago, as compared with 410 by the direct railroads.

The National Railroad Foot Guard.

This device is an improved form of foot guard designed for use in filling frogs, switch openings, etc. The guard, which is of sheet steel, consists of two parts which slide on each other and between which are two spiral springs. These parts fit tightly against the under side of the rail head and by sliding on each other, allow the guard to close and open with the movements of the switch rail, without interfering with its action or presenting any obstruction to wheel flanges and are moreover easily inserted in a frog. Fig. 1 shows a cross section of the guard in place between the rails, and Fig. 2 a longitudinal section on the line A B. Fig. 3 is a plan of the 42-in. guard in place. Fig. 4 is a perspective view, showing the general construction of the device.

The guards are made of various lengths, from 4 to 42 ins. Fig. 3 shows a 42-in. guard as applied to a No. 1 frog. They are also made of sizes suited to various weights of rails.

The tongue which is swivelled to the forward end of the guard, is provided with a spike hole, as seen in Fig. 3. Through this tongue a spike is driven into the tie, which prevents the guard from moving from its place. In case a tie is not convenient for this purpose, heel braces are placed against the rear end of the guard. In order that the switch points may work with ease the guards should be placed opposite each other. In this way one guard will turn the other, since the springs work in opposite directions.

This guard has been tested by use upon several roads and has given very satisfactory results. The National Railway Foot Guard Co., of Columbus, O., the manufacturers, furnish them for any size of rail and for any frog angle.

An English Tunnel Accident.

On the 23d of March an ugly little tunnel accident occurred on the London & Southwestern Railway near Guildford. The tunnel is 360 yds. long, through a hill

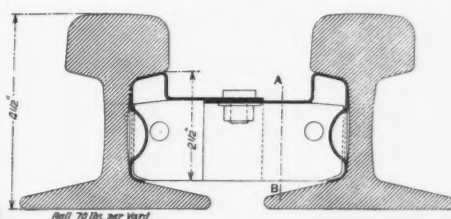


Fig. 1.

consisting mostly of sand. It is probably more than 50 years old, and is lined with red brick, six courses deep. There is not much material above the roof of the tunnel, and on the hill immediately above stood stables and coach houses. A train of empty carriages was just about emerging from the tunnel when a mass of sand and earth, estimated at a thousand tons, fell. The engine driver, fireman and guard all escaped, although two of them were severely injured. Several of the carriages were smashed. About an hour later a further subsidence took place and the engine and foremost carriages were completely buried. The railroad established a transfer by carriage. The line blocked was that to Portsmouth, and the accident did not affect the Southampton line.



ESTABLISHED IN APRIL, 1856.
Published Every Friday
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The presidents of the principal trunk lines and other officers of other lines, including the principal roads in the Central Traffic Association, met in New York on Tuesday last and voted to restore east bound freight rates on April 22, the date set for the opening of navigation on the lakes, and to maintain passenger rates according to the agreement of Jan. 1. The passenger agreement was amended so that no road may hereafter withdraw until complaints shall have been investigated by the Board of Presidents. In view of the reckless manner in which grain rates from Chicago have been cut during the last few weeks, and of the number of roads said to have been engaged in it, the proof of this part of the pudding will be in the eating. We shall have to wait and see. The passenger difficulty seems to have arisen wholly from an irregularity discovered at St. Louis where a scalper sold east-bound tickets over the Big Four at reduced rates. It was reported on Saturday last that the Chesapeake & Ohio, as well as the Baltimore & Ohio Southwestern, had withdrawn from the agreement, but it is now said that both of them have withdrawn their complaints and will continue to maintain rates. As the east-bound passenger rate situation is said to have been in a healthier condition, during the last three months, than it had been before for a very long time, it is to be hoped that the present poulitice will have the desired effect. The general outcome of the meeting is reported as "most gratifying," but whether the final results will be worth as much as the space we are taking to tell of them, is open to doubt.

The Interstate Commerce Commission has come out with a real, live sensation, although there is a string attached to it. It is announced that the application of the Southern Railway for the suspension of the fourth section of the Interstate Commerce law, so as to allow the reduction of through passenger rates, to compete with the Seaboard Air Line, which a few weeks ago reduced the rates between Washington and Atlanta about 40 per cent., will be granted, but only upon the following conditions:—

First—Such higher rates for shorter distances shall not in any case exceed the lower rates for longer distances by more than \$5.

Second—Such lower rates for longer distances shall not in any case be less than those previously published by the Seaboard Air Line or other competing carrier between the same points.

Third—Such lower rates for longer distances shall not in any case be less than the cost of the service rendered.

This order is hereby declared to be temporary and provisional, pending further investigation by the Commission, and the same may be modified or revoked at any time, with or without notice, in the discretion of the Commission.

In view of that third proviso, and of the general tentative character of the order, it will probably be just as well not to comment on the decision at present. The further investigation of the commissioners may show us some way of finding out what the cost of passenger service is; if so the occasion will be hailed with joy, for that is a question that many people have long wanted to see answered. Some men, on some roads,

think that passenger rates are already below cost, especially where people, in not very large numbers, are carried at two cents a mile, or less, in such palatial trains as are run by the two roads involved in the present controversy.

The proposed agreement on a plan for making coupon tickets harder to counterfeit is making some progress, though the committee of the General Passenger Agents' Association was not ready to recommend any definite action at the March meeting. The gist of the report is that safety paper shall be used; that a list of responsible printing firms should be made up as the ticket printers to the Association; that a trade mark be adopted and appear on the ticket; that railroads shall honor foreign tickets only when the issuing road has been authorized in writing to sell such tickets and that lists shall be printed for conductors showing the names of such authorized roads. This list would come to include all prominent roads and would be formally approved by the Association, so that it could be uniform on all roads, or nearly so. This is in every way an admirable idea. It is only following out familiar examples in other departments of business, and its tendency will be to bring the issuance of tickets up to a business-like position, where it ought to be. Immunity from counterfeit frauds in the past has been chiefly due to the fact that counterfeiters could spend their time more profitably in other lines, not to intelligent precautions on the part of the railroads. But the counterfeiters that have appeared during the past two years indicate that the men who are liable at any time to adopt this method of making money are becoming more numerous, and the need of taking measures to repress them is correspondingly more pressing. The proposed arrangement is familiar enough on the stock exchanges, where securities cannot be listed unless the engraved bonds or certificates answer certain specified requirements as to workmanship. One obstacle to effective action at the September meeting may be the multiplicity of kinds of paper to choose from. A greater obstacle will be the cost of anything like a complete abolition of old issues, which would involve throwing away thousands of dollars' worth of printers' work. But if a majority cannot be got to agree upon any one plan, it would be a step in the right direction for a few roads to act together. This would be a beginning in protection against counterfeiters.

The proposition to regulate the employment of railroad telegraph operators by law, which has been presented in a number of state legislatures within the last year or two, has now appeared in New York. Representative Audett, of Brooklyn, having presented a bill making it a misdemeanor to employ any person under 18 years old to send or receive train orders unless he has had a year's experience at telegraphing. This is not exactly the same as telling a boy that he shall not go near the water until after he has learned to swim, but the wording of the bill suggests that kind of a regulation. This is a matter which cannot be regulated by a hard and fast rule fixed in statutory form. Probably nine-tenths of the fatal blunders due to inexperience or lack of training have been made by persons over 18 years old; that is, persons who have both the age and the experience prescribed in this bill. Experience in telegraphing alone is but a single item, and it is not a decisive qualification, because so many operators with even two or five years' experience are yet poor operators. The age qualification means experience in the whole field of life; but this, again, is of indefinite value. The essential demand is for a person who has had experience and training in the line of work he is to do: sending and receiving messages, delivering them to conductors, holding trains, and the whole procedure specified in Rules 500-527 of the American Railway Association. A law stipulating experience should specify where or under what kind of a tutor; but how can the legislature of New York or of any other state do this? If there were a school of train despatching, with the author of "The Train Wire" at its head, some good might be effected by means of diplomas, but as long as there is not such a school, and no systematic discussion has been had by qualified persons as to the minimum of ability that could safely be tolerated, the legislature can only work in the dark. A crude law like Mr. Audett's, only scratching the surface, helps to inspire disrespect for all laws, as it is so poorly adapted to the problem in hand that it will not be thought of three months after its passage. If there are incompetent operators in the service of New York railroads the railroad commissioners ought to inquire into the subject and report the actual facts of the situation.

The most prominent defect in the training of telegraph operators for railroad service is the loose way

of bringing the teachers and learners together. A beginner generally learns to telegraph from a second-class operator, learns the other important duties of his position—how to manage his signal and how to deal with trainmen—from a second-class station agent, perhaps, and for the finishing touches—touches to make up for the deficiencies of these teachers—dependence is placed either upon the division operator or the despatcher, communicating chiefly by wire, or upon the learner's native ability. The highest grade teacher comes into personal contact with the pupil very little, if at all. A few weeks in the office with a first class despatcher is worth more to most pupils than a year at a small office with the average operator. We know of roads on which a reform in this feature would produce an improvement in the service; but publicity at the hands of the Railroad Commission is the only instrumentality that the State can apply at present with any hope of useful results. A specific statute would run against a snag in trying to designate the suitable despatchers for instructors. A speaker at a recent meeting of the Central Association of Railroad Officers, brought out an important point in connection with the personnel of the telegraph service, to wit, that operators handle all sorts of communications between the officers of a road, and are therefore in the position of confidential secretaries; and, consequently, that the moral character of all applicants should be particularly looked into. It has been the boast of the telegraph service of America that thousands of operators, working for small pay and under no bonds, or any very impressive pledge, have faithfully kept the secrets of telegrams, with exceedingly rare exceptions; but this is no warrant for neglecting all reasonable measures to keep this standard from being lowered. Moreover, the Superintendent who looks sharply to moral character is pretty sure to find all his problems of discipline much easier to deal with.

We are disposed to think that the commission appointed by the President to look into the plans and estimates of the Nicaragua Canal Company, will do all that can be done with \$20,000. We can speak from considerable knowledge of one member of the commission. The others are men of distinction in their corps, and are undoubtedly men of character and ability; but we know that Mr. Noble is an able, experienced, patriotic and resolute man. He was a soldier before he was an engineer, and even before he was an engineering student, and he is a man with a solid and controlling sense of duty. We should think a good while before questioning his judgment on any subject that he undertakes to study. On the other hand, the appropriation is doubtless entirely inadequate for an examination of the canal route or routes. The route adopted by the canal company can unquestionably be gone over by the commission, and the commission can judge whether or not enough data have been collected to make it possible to make a reasonably safe estimate of the cost of construction; but with the funds available they cannot collect much more data concerning this route alone. As to any other routes, it would be quite impossible for the commission to examine them, and we suppose that such an examination will not be contemplated in the instructions to the commission; but that other routes should be examined before the route is decided upon cannot be doubted. The route adopted by the company was not accepted, even by the company's engineers, without doubts and reservations in the minds of some of them at least. There was a pretty strong judgment in favor of the lower or Lull's route, which does away with the great dams and the tremendous divide cut. It is at least an open question whether or not the route selected is the best or anywhere near the best. So, while we are prepared to believe that the commission which will shortly sail will do the best that could be done with the funds at its disposal, and under its instructions, we fear that the report cannot be conclusive from an engineering point of view alone, much less as a study of the commercial results and possible returns.

Train Despatching Without Duplicate Orders.

In a preceding article we have spoken of defective discipline of telegraph operators. Unfortunately some roads tolerate unsystematic operators at headquarters as well as at way stations. Near Veazie, Me., on the Maine Central, on the morning of April 2, there was a butting collision of passenger trains in which one fireman was killed and several other persons injured, due to what seems to have been very careless practice in the despatcher's office. The collision occurred about 7 o'clock in the morning, just as the night despatcher, Barry, was going off duty. This man testified at the inquest that he gave three dif-

ferent eastbound trains orders against westbound passenger train No. 64, but held the latter simply by putting out a train order signal for it, sending no copies of the orders. Just as the day despatcher, Crossman, came on, and while Barry was washing his hands, the operator holding the westbound train asked for orders, and the night man, asking Barry what the signal was out for, was answered that it was out for meeting orders with trains 71 and 37; but in fact a third order had been given, to train 93, and this Barry forgot. Crossman ought to have looked at the record, but Barry ought not to have given the verbal information. Barry testified that the rule requiring orders to be sent in duplicate if possible was violated frequently and whenever it would facilitate business.

Such practice as this sets at naught the accumulated experience of 30 years. Of all the roads that have adopted the standard code we have not heard of one that has altered or omitted the provision of rule 510 requiring the despatcher to send a copy of every meeting order to the superior train, and to know that the operator who is to deliver the order to that train has received it and has displayed a signal to stop the train, before he (the despatcher) permits the inferior train to act upon the order. Latitude is allowed in various other things, but not in this. Only a very few roads have tried to have orders always delivered first to the ruling train, or even to have them thus delivered *always* when it is possible to do so; the provision to do so "whenever practicable" is not carried out to the utmost extent; but no one, so far as we have heard, has abated the requirement that orders shall be placed first at the station where the ruling train is to receive them.

This almost universal use of the committee's rule, added to the high reputation of the members of the committee and the well-known fact that their labors were exceedingly painstaking and thorough, throws a strong presumption of neglect upon a road that operates a single track line without the block system, and with any less stringent regulation for the issuance and delivery of meeting orders.

This case once more calls to mind the fact that the subtlest dangers that a despatcher needs to guard against are those that arise when he deals with a number of orders at once, all or several of which affect the same train. This it is that necessitates the rigid enforcement of the detailed rules. On a road of thin traffic, where the orders are naturally spread many miles apart, it is easy to differentiate them in the mind so as to depend upon the memory a thousand times without failure; but such dependence is fatal sooner or later; sooner on a busy road, later on one not so busy. It is fatal as regards the company, even if not from the standpoint of the individual despatcher. He may be that rare individual whose alertness of mind will never fail while he is on duty, but it is fatiguing to assume that his successor will be equally fortunate.

Mr. Barry said he held train 64 by a blue flag. The use of this signal is presumptive evidence that the Maine Central is behind the times. Blue is worse than green for becoming quickly dingy or neutral-colored, and even green has very generally been abandoned for red as a danger color. A blue light is still worse than a blue flag. It must be that the principal dependence is placed upon the vigilance of the enginemen and their thorough knowledge of the precise location of the telegraph offices. It would be possible, of course, to have runners slacken speed at every office and look in at the window, or to adopt any one of a dozen other clumsy devices, but why be thus blind to all experience?

The use of any other color than red for a train order signal had its origin, of course, in the feeling that this is not a danger signal; but every collision shows up this fallacy, and it would seem as though we had had enough collisions to make the matter plain to everybody.

Demurrage on Freight Cars.

The reader will have observed, from a paragraph in one of our recent Chicago letters, that the Chicago car service association is not to be weakened by the withdrawal of an important road, but, on the contrary, is to be strengthened by having its supervision placed in the hands of the general superintendents. We do not pretend to say, without qualification, that taking the direct management out of the hands of the general managers of the roads will surely improve the situation; but in the nature of things it ought to do so, for the management of demurrage collections is a continual tussle with questions which must be settled on grounds of expediency, and the officers nearest to the actual work are the ones who should have the final authority, as far as possible. The only way, of course, that a score of superintendents can manage demurrage at impor-

tant competitive points, with even moderate success, is to do it through a manager whom they can trust to use his own judgment, and then to trust him—that is, back up his decisions.

We print this week a letter which we received at the time the Milwaukee road threatened to withdraw from the Chicago association, but which we did not publish at that time, because it lacked definiteness. But after finding, by inquiry, that the writer's practice bears out his preaching, we have concluded to publish the letter; for it contains suggestions which some demurrage managers that we know of could act on to the advantage of their associations.

The task of the demurrage manager is to deal with all the elements of the rate problem in miniature. He can get the favor of customers by slight concessions, and can sour them by being too rigid. He can be overbearing to small traders and has ample opportunity to unjustly discriminate by being too easy with large concerns, simply because they are large. This last is the most insidious danger to be guarded against, and the fact that it is not always looked out for as it should be is the reason why we print that letter.

The plea that cars shall be used to travel and not to stand on side tracks is old, but it is still urgent. As long as we cannot introduce a per diem scheme between borrowing and lending railroads, there is no way of meeting this plea but to do the best possible with per diem against consignees (and we should have to do this even if we had the right principle applied to interchange rates). Car-charges against consignees can be managed equitably only by a man of firmness and judicial temperament; and at competitive points he must be impartial, or fail. The only practicable way to insure the reference of all cases to the one impartial head is for local agents to collect all bills, regardless even of plausible arguments for exceptions, and credit the money to the manager. The rules on which the justice of a demurrage charge is based are so variable that only by a rigid plan like this is it possible to make any substantial headway. Consignees who have suffered from unwarrantable delays in getting overcharges refunded, may say that it is not necessary to advise railroads to collect money regardless of doubts as to their right to do so; that they will do it from force of habit. But we remind such critics that the doubt in a demurrage case is not nearly so great as it seems to be from their point of view; and if they are readers of the *Railroad Gazette* they know that we have advised the railroads as strongly against a rigid policy in overcharges, and other matters, as we do now in favor of such a policy.

But, as we have just said, collections must be rigid chiefly for the purpose of bringing all cases before one official, the manager, who will treat all competitors on the same basis; and he must be as flexible as may be required by the inexact nature of the rules on which his action must be based. This means a great deal. The most successful demurrage manager that we know of has so small a list of uncollectible bills that his record in this respect may practically be called perfect; but the secret of his success in keeping the consignees so well satisfied that they pay their bills thus willingly, is to be found in the fact that he refunds nearly one-fourth of the money that he receives.

The object of demurrage regulations is to get cars promptly unloaded. An efficient bureau is profitable to the railroads, even if it does not collect half enough money to support itself. To subvert this main object, variations of weather, defective service on the part of the railroads, and many other contingencies must constantly be allowed for, and if a manager does not refund a considerable percentage of his collections his efficiency is open to suspicion. Either the agents in his district do not charge demurrage with sufficient strictness, or else the manager is treating consignees too harshly.

Annual Reports.

Canadian Pacific.—The annual report of the Canadian Pacific Railway Co., for the year ending December 31, 1894, was last week published in full. When the last semi-annual dividend was passed several considerations united to make this action of the directors seem rather strange. The property was in good financial condition when last reported, the books showed the absence of any floating debt, the full August dividend had been declared, and, above all, the road was considered as, to a considerable degree, out of range of the depressing causes which have injured the railroads in the United States during the last year. The blow thus fell from an apparently clear sky, and stockholders have been waiting anxiously for the present report to answer their questions. In this case the answer is complete. The report shows the results of a year which has proved quite as disastrous to the Canadian Pacific as it has been to the railroads on our side of the line. The earnings of the road had been increasing steadily till 1893, when this advance ended, and for 1894 they show a large falling off.

This is shown from the following table, from which it will be seen that the earnings, gross and net, were less than in any year since 1890. The table below shows earnings and expenses for 1894 and the percentage of increase or decrease as compared with each of the preceding years:

	1894.	1893.	1892.	1891.	1890.
Earnings.....	\$18,752,163	10.5	12.4	7.1	13.3
Expenses.....	12,328,509	7.2	5.1	0.8	20.3
Net.....	\$6,423,309	17.0	23.8	19.8	0.2
Per cent. of working expenses.....	63.75	63.67	60.67	60.43	61.94

The first items to examine as affecting earnings are the volume of traffic and the rates. The table below gives the tons, ton-miles, passengers, passenger-miles and rates per unit for 1894, also the increase or decrease in percentages as compared with each of the four years preceding. It will be observed that the tons carried were almost the same as in 1891, and considerably more in 1890. The ton-miles were more than in 1890, and the rate was higher. The earnings from freight were about 1½ million less than in 1890, and \$1,400,000 more than in 1891. While the passengers were 7 per cent. more than in 1890 the passenger miles were 7 per cent. less; still the rate was so much higher that the passenger earnings were a little more than in 1890.

	1894.	1893.	1892.	1891.	1890.
Tons.....	3,891,501	7.9	8.0	1.1	15.2
Ton-miles.....	1,313,948,416	9.5	17.0	5.0	8.7
Rate, cents.....	0.87	0.87	0.84	0.91	0.84
Passengers.....	3,039,015	9.1	7.7	5.0	7.0
Passenger-miles.....	260,804,129	21.8	20.7	18.6	6.9
Rate, cents.....	1.85	1.69	1.69	1.70	1.74

An examination of this table will show clearly enough wherein the earnings fell off. It remains to consider the causes.

The President in his report assigns as the first cause of diminished earnings the low price of wheat and of all other agricultural products, from which followed a scarcity of money among farmers and the contraction of business throughout Canada. An additional heavy loss was sustained in an important period of the year just at the beginning of the Summer passenger business, from the floods in British Columbia, which stopped through traffic to and from the Pacific coast for 41 days, from May 26 to July 6. The damage from these floods is not all made good yet, and the year's results suffer by \$550,000 in cost of repairs, extra expenses and loss of earnings.

The Pacific steamships show an increase in profits of \$80,467, but all of the other allied businesses, that is, telegraph, express, sleeping cars, grain elevators, lake steamers, hotels, etc., show diminished profits. The sales of land suffered more than anything else from the bad conditions, and indeed they almost ceased.

But, in addition to these forms of loss, the company has been subjected to very heavy burdens on another side. Its two subsidiary lines, which were acquired with the intention of providing important feeders from the territory of the States, have met with heavy losses, and, under its guaranty of the obligation of these roads, the Canadian road has had to advance \$456,187 for the Duluth, South Shore & Atlantic, and \$694,487 for the Minneapolis, St. Paul & Sault Ste. Marie. Again, besides all this, the interest on the land grant bonds due the Government for the last year is now for the first time entered as part of the fixed charges, and to this item is added the accumulated interest of these bonds for the past. The sum of this amounts to \$2,769,347.

The sum of the matter is that the net earnings, as above, were.....	\$6,423,309
Net interest.....	333,826
Available.....	\$6,757,135
Fixed charges.....	6,589,379
Guaranteed interest, M., S. P. & S. Ste. Marie.....	\$167,756
Deficit.....	694,487
Charging off from the surplus of Dec. 31, 1893, which was.....	\$236,731
Deficit as above.....	\$7,261,213
Dividends on preference stock.....	\$526,731
August dividend on common stock.....	256,560
Accumulated interest on land bonds.....	1,625,000
	2,112,729
Surplus Dec. 31, 1894.....	4,521,420

Surplus Dec. 31, 1894..... \$2,739,753

Two years ago \$4,000,000 was deposited as a special fund applicable to dividends, and it was partly the existence of this fund which made it seem so strange that the company should pass its January dividend. But it is now seen that a large part of this fund had been already taken during this year, not only for the August dividends, but for payment of the balances due the subsidiary roads, for interest on land grant bonds. The only other courses possible to meet these charges were to sell securities belonging to the company, which could only have been at a great loss under the present situation, or to incur a heavy floating debt. This latter course would be in direct contradiction to the policy of the road during its whole lifetime. Consequently, the special reserve fund has been diminished, and, after charging off the above-mentioned items and the deficit of \$526,731 for the last year, there is left a surplus of \$2,739,752, as against \$7,261,213, on Dec. 31, 1893. In view of this financial situation it is evident

that the passing of the January dividend was a sound move.

The report, including President Van Horne's opening speech, declares very frankly the policy of the management, and goes so far as to admit that the declaring of even the August dividend may have been a mistake. It was declared in anticipation of a marked improvement in the grain crop, which at the time seemed probable, but afterward proved disappointing. As to the two subsidiary roads, which have proved so much of a burden this year, the management still retains confidence in their future value.

The criticism which the management passes upon itself in the present report is that during the last few years it has been over-sanguine, but it is believed that it is only the present temporary depression which has prevented a full realization of all its expectations. As President Van Horne says: "The difficulties through which we are passing will not only have taught us some useful lessons, but will prove the strength rather than the weakness of the company."

The increase in capital account in the year was \$1,570,395, which was met by the creation of £300,000 of 4 per cent. debenture stock, which exhausts, within £116,550, the company's power to create this stock except for redemption or conversion of existing obligations. The shareholders authorized the expenditure on capital account during this year of \$461,091, chiefly for permanent bridges.

Chicago, Burlington & Quincy.—The annual report of the Chicago, Burlington & Quincy for the year ending Dec. 31, 1894, is published this week. The situation is so well understood and has been so thoroughly discussed that little need be said now of this particular report. There are, however, one or two striking facts to observe in passing. One paragraph of four lines in the President's remarks suggests, perhaps better than the figures of the tables, the depression throughout the territory served by the system and the suffering that must follow. At the end of 1892 there were on the rolls of the entire system the names of 28,745 persons. At the end of 1894 this number had been reduced to 21,115, a decrease of 7,630. More than one-quarter of the entire force had been discharged. There is another paragraph in this report that has an unusual air of candor. The President says that for three years past, in reducing expenses, repairs on rolling stock and buildings have not been fully kept up, and it is estimated that about \$1,000,000 ought to be expended to put them in good shape. Cars and engines needed for service are kept in good order, and track and bridges have been well maintained. As a rule we are told that in spite of the heroic economies that have been forced upon the companies the physical condition of the property was never better, which, of course, must be taken as an amiable fiction.

The principal results of operation, compared with the two preceding years, were as below:

	1894.	1893.	1892.
Gross earnings.....	\$24,667,132	\$31,042,970	\$33,022,394
Expen. and charges..	23,814,852	28,838,765	29,662,508
Net earnings.....	\$852,280	\$2,204,204	\$3,359,886
Percentage of expen., including taxes.....	66.02	68.37	68.08
Passenger-miles.....	255,565,171	409,529,533	325,611,118
Ton-miles.....	1,770,402,697	2,099,080,071	2,345,442,151

It will be remembered that dividends at the rate of five per cent. per annum were paid for the first three-quarters of 1894, while for the last quarter only one per cent. was paid. The net earnings as above were \$852,280. Other income, including dividends and interest on the securities of controlled roads, amounted to \$1,938,852, making the total available revenue \$2,791,132; and, after paying dividends of \$3,895,128, there was a deficit of \$1,103,997. The item of operating expenses and charges given above includes taxes, rentals, interest on bonded debt and sinking funds, as well as working expenses proper. The working expenses, not including taxes, for the last three years have been: 1894, 15 millions; 1893, 20 millions; 1892, 21.2 millions. The items of principal working expense in the three years are compared in the table below and are in millions of dollars.

	1894.	1893.	1892.	1891.
Train, engine, station and water service.....	\$7.85	\$9.54	\$9.89	\$8.45
Repairs, track, bridges, etc.....	3.29	4.25	4.78	3.44
Repairs, cars.....	0.82	1.90	2.07	1.69
Repairs, locomotives.....	1.01	1.45	1.48	1.26
General expenses.....	1.59	1.83	1.88	1.67

The Anthracite Negotiations.

Distinct progress has been made within the week toward relieving the anthracite situation. The presidents of the 12 shipping interests met with their traffic agents and coal officials on Friday to hear from the committee appointed to report a basis for a settlement or in lieu thereof a statement setting forth the demands of the different interests. The committee being unable to effect an agreement, so reported. The barrier up to this time had been the demands of the Lehigh Valley and the New York, Susquehanna & Western and some few issues raised by other companies, involving transportation problems. The feeling was quite general that the Lehigh Valley should be allowed to increase and it was believed that the Susquehanna could be compromised with. In fact the outlook was promising when the Reading suddenly made a demand for an increase in percentage from 20.3 to 21 per cent. This upset the negotiations, effectually terminated all hope of a settlement by agreement at that session and led to the decision to submit the issues to the five presidents, who are said to have asked for

changes in their percentages, for a settlement, with the understanding that if they cannot agree the matter is to be submitted to arbitrators. This board of presidents is constituted as follows: Sloan, of the Lackawanna; Olyphant, of the Delaware & Hudson; Roberts, of the Pennsylvania; Wilbur, of the Lehigh Valley, and Harris, of the Reading.

It was the sense of the meeting that the matter must eventually be arbitrated. So strong was this feeling that the names of two arbitrators have been suggested. These are Albert Fink and Charles Francis Adams. The presidents' committee in lieu of a settlement are to recommend to all the interests a board of arbitration. Upon the appointment of a board its powers will be prescribed.

A resolution was adopted at the meeting endorsing the action of the sales agents fixing the output for April at 2,600,000 tons, the understanding being that all of the companies should operate on the basis of 1894, subject to an adjustment in conformity with a final settlement. A favorable development was the decision to advance prices. This was done at a meeting of the sales agents held on Monday to the following basis: Tidewater, broken, egg and chestnut, \$3.35; stove, \$3.50 f. o. b. gross, and to the West, broken, egg and chestnut, \$4.00; stove, \$4.75.

The new tidewater prices are an advance of 35 cents a ton, and the Western prices from 35 to 50 cents a ton over current rates. The new circular can be regarded as the spring price. It is usual to lower rates for the summer trade in April. The spring circulars for a series of years follow:

	1895.	1894.	1893.	1892.	1891.	1890.
Broken.....	\$3.35	\$3.50	\$3.90	\$3.25	\$3.50	\$3.40
Egg.....	3.35	3.50	3.90	3.25	3.50	3.40
Stove.....	3.50	3.75	4.15	3.50	3.75	3.50
Chestnut.....	3.35	3.75	4.15	3.00	3.50	3.25

Prices are f. o. b. gross.

It will probably be some time before the benefit of the new prices is felt, as heavy orders have been booked at the low rates. The step is in the right direction, however, and will go far toward restoring equilibrium and profit in the trade.

A factor which has rendered the Lehigh Valley so anxious to reach a settlement is the demoralization in Western prices, which are at or below cost. Those companies which mine their own coal are not as hard hit by this condition as are the concerns which buy largely of independent operators, paying 60 per cent. of the tidewater price therefor. The Lehigh Valley buys more than half of its coal on this basis.

The Chicago fake factories did not succeed in working off all their old material on April Fool's day. The masterpiece of that day was the elevated railroad from Chicago to New York for carrying grain. Having become familiar with large figures the chief news dispenser of the establishment found on Sunday morning last a fact, which, in the language of the promoters, "was calculated to severely tax" even his magnificent facilities. It was that 1,500,000,000 grains of wheat had been shipped eastward over the Fort Wayne road at a rate of about ten cents per 100 lbs. to New York. But it would not do to send out the facts without any coloring, and so he called it bushels instead of grains, thus giving the story a Chicago flavor. The second edition named the Hoosac Tunnel route as the fortunate possessor of this valuable plum; the third edition has not yet appeared, and so, for the present, we shall have to assume that in point of fact probably no such shipment was made at all. It is a pity, however, that the story is not true, for a billion and a half bushels would take all the freight cars in the country (with a few more, which could be borrowed from Canada and Mexico), and that would give every car a chance to try the "Chicago code of honor"; to see how it would feel to be passed by an inspector without being subjected to the indignity of a defect card.

A butting collision of passenger trains at Veazie, Me., is noted in another column. There were two other bad train accidents last week. On the Chicago & Alton, near Alton, Ill., on the morning of the 5th, a freight train was derailed by a broken truck, and it turned out that there were over 75 tramps on the train; four of them were killed and 15 others injured. Near Whigville, O., on the Bellaire, Zanesville & Cincinnati, a passenger train broke through a trestle bridge on the morning of the 5th, and fell 50 ft. to the ravine below; four persons were killed outright, two more fatally injured and several others badly hurt, the only reason that the list was not longer being that there were but few passengers on the train. This is a narrow gage road, and the train consisted only of the engine and one car. It is said that the car jumped the track before it reached the trestle. It is further stated that the train was running slowly, though it is also stated that the car was dragged half-way across the trestle on the ties before it fell off.

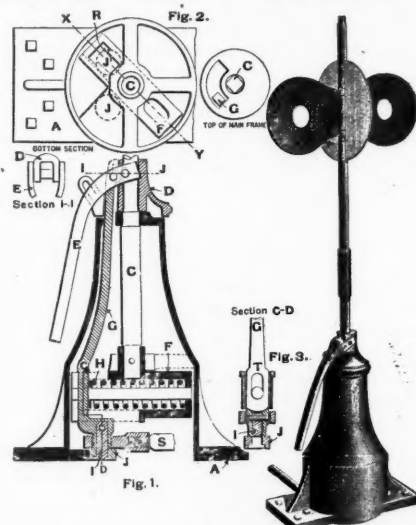
The legislature of the state of Washington, which recently adjourned, passed no laws of great interest to railroads. House bill No. 191 regulates the right of corporations to enter upon premises for the purpose of making a survey. A law was passed providing for the appointment by the Governor for each transcontinental railroad of one weigher to weigh shingles and lumber shipped beyond state limits. These are all that we can find directly affecting standard railroads. There is an act requiring street railroad companies to provide weather guards for the protection of employees, and one restricting the hours of labor of gripmen, motormen,

drivers and conductors to 10 hours a day. A bill providing for the construction of a state road (highway) through the Cascade Mountains at Natchez Pass, at an expense of \$20,000, was passed, but was vetoed by the Governor.

The Sterlingworth Switch Stands.

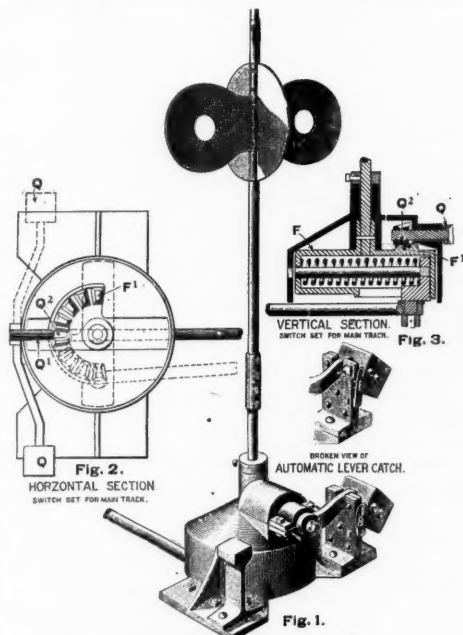
The Sterlingworth Railway Supply Co., of New York City, is making two forms of switch stands under the names of the "Inflexible" and the "Automatic."

The "Inflexible" stand, for split switches has rigid throw, so that it is impossible to lower and lock the lever handle until the switch points are fully thrown over against the rails. It is movable, when locked, only through the rails and connecting rod—and is so constructed that wear of parts does not affect the throw. As is seen from Fig. 1, the lever *E* may be locked down. To throw the switch, this lever is raised, and, through *G*, raises the pin *I* and



Sterlingworth Switch Stand—Inflexible Pattern.

roller *J* above the level of the base plate *A*. It may then be turned until the roller *J* again drops below the level of *A*, taking position *J'*, Fig. 2. Any pull through the connecting rod *S* is transmitted to the spring in the frame *F*. When the roller *J* is above the level of *A*, the shoulder *T*, of *G*, Fig. 3, by engaging with the shoulder *R*, Fig. 2, of the frame *F* carrying the spring prevents any pull from coming on the spring. That is, the raising of the lever locks the crank pin from its spring bearing. The operating lever cannot be lowered and locked until the crank pin itself, and not the lever handle, has made a complete revolution. This form of stand avoids



Sterlingworth Switch Stand—Automatic Pattern.

breaking of switch points, since any pull on the connecting rod is at once transmitted to the spring, except, as shown above, while the switch is being turned.

The "Automatic" stand is so arranged that the switch if left open, will be automatically thrown, by the train, to the main track, and if set for main track, will allow a train to pass out of the siding and still leave the switch set to main track as before. It is operated by one direct movement of the lever. Fig. 1 shows a perspective of the stand. A turning motion is given to the spring-carrying frame *F*, Fig. 3, from the weighted switch lever *Q*, journaled in the frame at casing, and carrying at its inner end a pinion, *Q'*, in mesh with a segmental gear wheel, *F'*, formed or secured on the top of the frame *F*. Now, when the switch is set for the main track, the several parts are in the position shown in full lines in Figs. 2 and 3, and when the switch lever *Q* is thrown over into the position shown in dotted lines in Fig. 2, the shaft *Q'*

by the pinion Q^2 , engaging the gear wheel F^2 , revolves the spring-carrying frame so that the switch is set for the side track. When in this position a train on the main track by trailing the switch, automatically turns and locks the stand for the main track.

It is to be noted as a peculiarity of this switch that the radially movable crank pin admits of the switch rail moving under the influence of the passing trains, without requiring rotary motion of the crank or shaft, or the unlocking of any of the other parts.

TECHNICAL.

Manufacturing and Business.

The Havana Bridge works of Montour Falls, N. Y. (formerly Havana), has been organized with a capital stock of \$30,000. Robert T. Turner, Louis G. Rathbun, Nicholas D. Doney, Charles J. Root, of Elmira; Charles D. Clawson, James A. Shepard, and Francis H. Shepard, of Montour Falls, are the directors.

The Findlay Rolling Mill Company, of Findlay, O., has been attached by a bank of Cleveland, and several judgments have been taken against the company. About 400 men are thrown out of employment by the closing of the mill.

The Standard Air Brake Co., of New York City, has been organized to manufacture air brakes and railroad appliances, with a capital of \$50,000. Henry Seligman, Albert Strauss, Theodore Seligman, Edward D. Phillips, Leopold Wallach and Edward J. Wessels, of New York City, are the directors.

The Chicago Grain Door Co. has just received an order from the Great Northern Railway Line for grain door fittings for 500 box cars.

The Moore Manufacturing & Foundry Co., of South Milwaukee, Wis., has contracted to supply the Southern Railway Co. with all the hardware needed for 1,000 new cars.

The organization of a new company to succeed the Hamilton Bridge Co., of Hamilton, Ont., which was recently sold at foreclosure, is now proceeding and the new company expects to soon take over the plant of the old company. It is being organized with a capital stock of \$100,000.

The Litho-Carbon Rubber Co. with headquarters at 130 Fulton street, New York city; has recently received some large orders for supplying rail roads with a fire, water and acid proof paint which it has recently introduced. This company owns 16,000 acres of land in Texas where the mineral from which this paint is made, is found. Harrison Brothers of Philadelphia make the paint, which is being used by the Baltimore & Ohio, Southern Pacific, San Antonio & Aransas Pass and several other roads. The officers of the company are: President, W. L. Boyd and Secretary, R. T. Rokebey.

Iron and Steel.

The Coosa Iron & Railroad Co. has been organized in Alabama for the manufacture of iron and steel. T. T. Hillman, George R. Morris and T. J. Caldwell, are the incorporators.

The American Malleable Iron Co., of Latrobe, capital \$20,000, was incorporated at Harrisburg on April 3. The directors are: Martin A. Cutter, Thomas M. Rees, David P. Corwin, William B. Neall and H. A. H. Neall.

Last week at the Pennsylvania Steel Works, at Steelton, Pa., was one of unusual activity. Every department had a full complement of men at work, and the frog-shop had double turns on. The product at the rail-mill was all T-rails and unusually large, while that of open-hearth furnaces was up to its capacity. The bridge and construction department is stocked with work and orders sufficient to keep it busy for a long time. Not for several years have the prospects been as bright for a busy summer as they are now.

New Stations and Shops.

The shops of the Southern Railway at Knoxville, Tenn., will include the following buildings: Machine shop, 100 ft. x 322 ft.; smith shop, 90 ft. x 322 ft.; erecting shop, 90 ft. x 342 ft.; paint shop, 90 ft. x 322 ft.; store house, 50 ft. x 142 ft.; sand house, 20 ft. x 70 ft.; paint storage house, 40 ft. x 65 ft., and oil and waste house, 20 ft. x 30 ft. The shops, when in full working order, will employ about 1,000 men, machinists, carpenters, blacksmiths, boiler makers, brass moulders, copper smiths, tin smiths, painters, pattern makers, upholsterers, etc., as well as a large number of unskilled laborers. The shops will have a capacity to keep in repair fully 8,000 freight cars, 300 passenger train cars and 150 locomotives. These shops will be equipped with the latest improved machinery of all kinds for wood metal working.

The new boiler house for the Hartford Gas Light Co., at Hartford, Conn., has been completed by the Berlin Iron Bridge Co., and the company is putting up for the New Jersey Magnetic Concentrating Co. a new dryer plant, at Lyon Mountain, N. Y., of iron, designed by the Bridge Company.

The Pennsylvania Railroad is to erect a new round-house and a car and machine shop at Blairsville, Pa., at the junction of the West Penn division with the main line.

The New York, New Haven & Hartford is understood to be preparing plans for a new station on its Old Colony Division at Newport, R. I.

The Northern Pacific is to erect a new passenger station at the town of Missoula, Mont. The improvements at that town will cost about \$70,000, and will include a rearrangement of the yards.

The Missouri, Kansas & Texas has begun the erection of its new office building at Parsons, Kan.

Interlocking.

The National Switch & Signal Co. has been awarded the contract for interlocking a junction on the Manhattan Beach Division of the Long Island Railroad, also two crossings on the Nassau Electric Railway with the Long Island Railroad at Atlantic avenue, Brooklyn and Rockaway avenue, Flatlands.

The Hogan Boilers.

A number of engineers, representatives of the technical press, and business men went to Middletown, N. Y., last Tuesday, to see tests of the Hogan vertical water-tube boiler, conducted at the Hogan Boiler Works in that town. The boiler tested was nominally of 100 H. P., with 28 sq. ft. of grate surface and 800 sq. ft. of heating surface. The steam was examined, first as it issued from a $\frac{1}{2}$ in. valve, under 125 lbs. pressure to show its dryness. To show the steadiness of the water line under sudden demand for steam, a 41-in. valve was suddenly opened to the atmosphere. This test failed because of the slowness with which the valve was opened. Had a quick opening gate valve been used, the water in the vertical tube would not have had sufficient time to overcome its inertia. As it was, the water column rose 8 in. Other tests were made, the results of which we expect to give later, together with a description of the boiler. One result shown was an evaporative power of $7\frac{1}{4}$ lbs. of water per pound of coal. It cannot be said that tests extending over such a short time and made so hurriedly are satisfactory, or do justice to the boiler. One feature of this boiler is the introduction of feed water at low temperatures, for the purpose of causing the incrusting to be precipitated in the mud drum and feed water tubes before the incoming water comes in contact with the surfaces exposed to the fire and heated gases. The boiler will thus not use a feed water heater, part of its circulation system being a heater in itself, the incoming water being heated by the descending heated currents of water. The boiler in the Hogan works has been in use for four months, and during that time it is claimed that an evaporation of 15.98 lbs. of water per lb. of coal has been reached, during a six hour run. The 350 H. P. boiler at the State Hospital for the Insane at Middletown, has been run up to 665 H. P. under forced draught, and has given an evaporative efficiency of 83 per cent. These two boilers are the only ones that have been built up to this time.

Electric Car for the Nantasket Beach Railroad. The equipment of the Nantasket Beach Branch of the New York, New Haven & Hartford with apparatus for moving cars by electricity was announced in the *Railroad Gazette* of March 1. According to the Philadelphia *Public Ledger* the bodies of the passenger cars for this service are being built by the Barney & Smith Co., of Dayton, O., and the trucks by the Baldwin Locomotive Works in Philadelphia. The Baldwin order calls for 32 trucks, which are of the ordinary four-wheel type with 36-in. wrought-iron wheels. The wheel base of each truck is 6 ft. 6 in.

Auction Sale of the Johnson Signal Property.

Receiver Savage announces that the property of the Johnson Railroad Signal Co. will be sold at public auction on April 25 at Rahway. Several bids were received in response to the notice issued a few weeks ago, but none of them was satisfactory to the court. The Chancellor of New Jersey will fix the terms of sale on April 15, a hearing for the purpose having been set for that day at Jersey City. The sale will be of the entire plant, including land, buildings, machinery, patents, patterns, manufactured goods and supplies.

THE SCRAP HEAP.

Notes.

The chime whistle has been adopted as standard for passenger locomotives on the Pennsylvania Railroad. Many of the engines are already equipped with these whistles.

E. V. Debs reports that 2,200 employees of the Great Northern have lately joined the American Railway Union.

The West End Street Railroad Co., of Boston, will begin carrying mails on May 1. The present arrangement provides for about 390 car-miles a day.

New appliances for handling coal are to be placed on the docks of the New York, Pennsylvania & Ohio Railroad at Cleveland which will materially decrease the time taken in loading vessels at that port.

The Duluth, South Shore & Atlantic has reduced the wages of all employees receiving over \$65 a month. The rate of reduction varies from 3 per cent. to 20 per cent., all persons receiving over \$3,000 suffering a cut of 20 per cent. and all over \$1,200 10 per cent.

The New York State Court of Appeals has decided that public officers are forbidden by the constitution to accept railroad passes and that the term "public officer" includes notaries public. The decision is written by Justice Gray, and all the justices concur. The case was that of the Attorney-General against William Rathbone, counsel for the Delaware & Hudson Canal Co., who was a notary public, but continued to ride upon his pass.

Train No. 1, of the Chicago, Rock Island & Pacific, was stopped by robbers near Dover, I. T., on the night of April 3, and most of the passengers were robbed. The robbers shot the express messenger, but did not succeed in getting anything from his car. They apologized to the passengers for their action, explaining that the times were hard. The robbers were pursued by the

sheriff and one of them was shot and killed on the following day. Two others were wounded.

According to a San Francisco paper there are 361 suits pending in the State Court at that city against the Southern Pacific for damages for violating the law in refusing to grant stop-over privileges to certain passengers. These suits have all been brought by six individuals, and the road has entered a counter suit asking for an injunction against them and demanding that they pay the road damages of \$5,000 each, on the ground that they are conspirators. It is alleged that they are not bona-fide passengers, but boarded the trains for the special purpose of resisting the rule of the road concerning stop-overs.

The Elevated Railroads in Chicago.

Lake Street Elevated.—Specifications have been prepared for the western extension of the Lake Street Elevated to Austin, under the franchise recently granted by the town of Cicero, and bids will be received in a short while. The work on the eastern extension to Wabash avenue, which has been delayed by the arrangement of the bond matter, will be resumed as soon as this is settled by the exchange of the majority of the outstanding bonds for debentures and income bonds, as set forth in the adjustment plan.

Metropolitan.—The annual meeting of the stockholders of the Metropolitan West Side Elevated held their annual meeting April 4. The election of directors resulted in the choice of Robert Jenkins, George Higginson, Jr., and Addison Gardner, for a term of two years. These gentlemen succeed themselves for a term of two years, and the board now consists of R. H. P. Durkee, John H. Glade and the above-named gentlemen. An announcement was made that the main line would be put in operation May 1. The Logan Square branch is now completed as far as the Bloomingdale road, while the work from Logan Square to California avenue is also finished, thus leaving a gap of three-quarters of a mile to be built up. The Humbolt Park line is completed west to within a block of Humbolt Park.

Northwestern.—The contract has been let for the foundations of the superstructure for the Northwestern Elevated to Angus & Gindale, of Chicago. The contract covers the entire line from the junction of Wilson and Evanston avenues to the junction with the loop on Lake street. According to this contract the work is to be completed within one year, and operations will begin shortly.

The Destruction of a Street Car in Chicago.

The Chicago General Street Railway Co., which operates a street car line on Twenty-second street west of the South Branch Bridge, has been trying to secure the right of way east of the bridge as far as Wabash avenue, but has been opposed in its plans by the Chicago City Railway Co. The company finally secured an ordinance from the City Council permitting it to operate cars over the present tracks of the Chicago City Railway east of the bridge on payment of a rental to be agreed upon. The officers of the two companies failed to agree upon a rental, and then President McGann, of the Chicago General Street Railway Co., decided to run a car over the tracks and have the courts decide what rental should be paid. On April 4, an attempt was made to run a car east of the bridge to Wabash avenue and back, but as soon as the car started down the eastern approach of the bridge an officer of the Chicago City Railway, with a force of employees and several wrecking cars, derailed the car and turned it over on its side. It was then broken up with sledges by the laborers. No injunction had been obtained to prevent the running of a car over the Chicago City Railway tracks, and President McGann made no attempt to prevent the destruction of the car, but the matter will be carried before the courts.

Railroad Taxation in Kansas.

The Supreme Court of Kansas has handed down a decision that railroad property must not be assessed at a greater valuation on the dollar than any other class of property, and that an injunction would lie to restrain the collection of the tax on an excess valuation. In 1893 the Board of Assessors of Atchison County agreed that all property except railroad property should be assessed at 25 per cent. of its actual value. The tax levy was made accordingly, and the Chicago, Burlington & Quincy, whose property had been assessed higher than 25 per cent. by the State Board of Railroad Assessors, refused to pay county taxes on more than 25 per cent. The court below refused to enjoin the County Treasurer, and the company carried the case to the Supreme Court, which, by this decision, sustained the railroad's position.

LOCOMOTIVE BUILDING.

The Richmond Locomotive and Machine Works is building for the Chesapeake & Ohio a heavy ten-wheeled compound locomotive with 20 in. and 32 x 24 in. cylinders, which is to be exhibited at the Atlanta Exposition, and then used in passenger service on the mountain division of that road, hauling the F. F. V. vestibuled train between Charlottesville and Clifton Forge. The works are also building for the Southern Railway a ten-wheeled compound locomotive for passenger service, with the same size of cylinders, but after the Southern Railway standard. The Southern Railway has also ordered six ten-wheeled 20 x 24 in. passenger engines and eight 20 x 26 in. consolidations. The Seaboard Air Line has given an order for seven 19 x 24 in. eight-wheel passenger engines and five 19 x 24 in. ten-wheel freight locomotives. Two of these engines will be exhibited at the Atlanta Exposition.

CAR BUILDING.

The Cleveland, Lorain & Wheeling order referred to two weeks ago has been awarded to the Michigan-Penninsular Car Co. This order is for 100 hopper-bottom coal cars.

The Missouri Car & Foundry Co. of St. Louis is building 25 gondola cars for the Kansas City, Osceola & Southern. The cars are to be 34 ft. long, 60,000 lbs. capacity and are to be equipped with air brakes and Gould couplers.

The Grand Trunk shops at Montreal have lately turned out two handsome new colonist sleeping cars which will run between Halifax and Montreal. These cars are finished in mahogany and upholstered in leather. There are two lavatories at one end, fitted up with marble and handsome mirrors, and a smoking compartment at the other end. Each car has sleeping capacity for 52 passengers.

BRIDGE BUILDING.

Canadian Pacific.—At the annual meeting of the shareholders of the Canadian Pacific Railway, held at Montreal last week, the expenditure was authorized of \$461,000, chiefly for permanent bridges. During the year 1894, 306 timber bridges, aggregating 6½ miles in length, were replaced with permanent masonry or iron structures or earth embankments.

Canajoharie, N. Y.—A bill authorizing an appropriation of \$16,000 for the erection of a bridge over the canal at this point has been passed by the New York Legislature.

Farnham, Quebec.—The Canadian Pacific Railroad Company's bridge at this town is to be rebuilt.

Kansas City, Pittsburg & Gulf.—J. A. L. Waddell, as Consulting Engineer for the Kansas City, Pittsburg & Gulf Railroad, has awarded the contract for six 50-ft. deck, plate girder spans to the Pittsburg Bridge Co. These bridges will be used on the new line to be constructed by this company to Shreveport, La.

Monterey, Mex.—The bridge work on the line of the Monterey Mineral & Terminal Railroad building at Monterey, Mex., by J. A. Robertson will include four framed trestles of 392 ft., of 294 ft., three of 140 ft. and five of 70 ft.

Newark, N. Y.—Governor Morton has signed a bill, passed by the State Legislature, authorizing the appropriation of \$8,000 for an iron bridge across the canal at his town in Wayne County, N. Y.

New York, Susquehanna & Western.—A coal trestle of steel, 300 ft. long and 100 ft. high, is being constructed at Pompton, N. J. The contract for the steel work was placed with the Passaic Rolling Mill Co. The weight is 300 tons.

Niagara Falls, N. Y.—In the Assembly at Albany a bill has been introduced providing that the Niagara River Bridge Co. need not begin the construction of its bridge until 1900, nor complete it until five years thereafter. The law incorporating the company provides that the bridge shall be begun this year. The company was incorporated in 1890 to build a bridge for railroad purposes from the right bank of the Niagara River at some point between 2,000 ft. north of the northerly bounds of the State Reservation at the Falls of Niagara and the old Suspension Bridge near Lewiston to some point in Canada.

Philadelphia.—Plans for the two Thirty-third street bridges over the Philadelphia & Reading and Pennsylvania Railroads, giving that street an outlet into the park by way of Girard avenue, are nearly complete, and in a few days advertisements will be issued from the Bureau of Surveys for the ground work and abutments. In 1893 an appropriation of \$70,000 for this improvement was authorized by City Councils.

Pittsburg, Pa.—Straub & Bickel, bridge engineers and contractors, with office at Pittsburg, have received from the Rio Grande Northern Railroad in Texas the contract for one 70-ft. deck span and one 65-ft. through span plate girders and one pin-connected deck span 100 ft. long, all resting on steel cylinder piers.

Wallington, Pa.—A new double track iron bridge is to be built on the Central Division of the Philadelphia, Wilmington & Baltimore Railroad, over Crum Creek, at Wallington, to replace the old wooden structure.

Weldon, N. C.—The citizens of Weldon, will build an iron and steel bridge across the Roanoke river at that point, to encourage trade from Northampton and Pitt counties across the river. The Seaboard Air Line bridge has a foot way, but no wagon road and accommodation for vehicles is the principal purpose for which the new bridge will be built. A committee has been appointed to correspond with bridge companies.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Central of New Jersey, 1½ per cent., payable May 1.
Detroit, Mackinac & Marquette, 1 per cent., payable April 12.
Long Island, quarterly, 1 per cent., payable May 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Central of New Jersey, annual, Jersey City, May 10.
Chicago, Burlington & Quincy, annual, Chicago, Ill., May 8.
Cincinnati, Saginaw & Mackinaw, annual, Saginaw, Mich., April 16.
Elmira & Lake Ontario, annual, Room 15, 20 Whitehall street, New York City, May 2.
Lake Shore & Michigan Southern, annual, Cleveland, O., May 1.
Michigan Central, annual, Detroit, Mich., May 2.
Missouri, Kansas & Texas, annual, Parsons, Kan., May 15.
New York Central & Hudson River, annual, Albany, N. Y., April 17.
New York, Chicago & St. Louis, annual, Cleveland, O., May 1.
Toledo, Ann Arbor & North Michigan, annual, Toledo, O., April 17.
Union Pacific, annual, Boston, Mass., April 24.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Car Accountants' Association* will hold its next meeting at the Palace Hotel, San Francisco, Cal., on April 16, 17, 18 and 19.
The *American Railway Association* will meet at the Planters' Hotel, St. Louis, Mo., on April 17.
The *Master Car Builders' Association* will hold its annual convention at Thousand Islands, Alexandria Bay, N. Y., commencing June 11.
The *Master Mechanics' Association* will hold its convention at the same place, commencing June 17. Applications for rooms for both conventions should be made to J. B. Wistar and Charles W. Crossman, both at Thousand Islands, Alexandria Bay, N. Y.
The *International Railway Congress* will meet at the Imperial Institute, London, England, beginning June 26.
The *American Society of Civil Engineers* will hold its annual convention at Nantasket Beach, commencing June 18.
The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.
The *New York Railroad Club* meets at the rooms of

the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October, at 10 a. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago. The business meetings are held on the first Wednesday at its rooms. The meetings for the reading and discussion of papers are held on the third Wednesday at the Armour Institute, Thirty-third street and Armour avenue.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1123 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The Civil Engineers' Society of St. Paul.

A regular meeting of the Civil Engineers' Society of St. Paul was held on April 1; 13 members and 12 visitors present, and Mr. A. O. Powell presiding. Mr. C. A. Winslow was elected a member of the society. Mr. Geo. L. Wilson read a brief historical sketch of the Chicago Drainage Canal, and illustrated, by lantern views, the method of excavating on several sections of the work.

American Institute of Mining Engineers.

The following officers were elected at the St. Augustine meeting of the Institute, just held: President, Joseph D. Weeks, Pittsburg; Vice-Presidents, W. B. Kunhardt, New York City; T. J. Lewis, Chicago, and C. A. Steffert; Board of Managers, L. Nolbrock, New York; W. R. Webster, Philadelphia; A. R. Ledom, New York; Treasurer, Theodore D. Rand, Philadelphia; Secretary, R. W. Raymond, New York.

American Society of Mechanical Engineers.

The fourth engineering evening was announced for Wednesday, April 10. The subject was "The Present Status of the Gas Engine and other Internal Combustion Engines"; Mr. Emerson McMillin to preside, and the opening remarks to be made by Mr. Sidney A. Reeve and Mr. Anson W. Burchard.

For the May evening, falling on Wednesday, May 8, the subject will be "Compound Locomotives," to be opened by Mr. F. W. Dean, of Boston.

Engineering Association of the South.

The regular meeting of the association was held at Nashville, Tenn., on April 5. A paper by Mr. Ormsbie on "Good Roads" was read by the Secretary. A road from Hill City, near Chattanooga, Tenn., to and up Walden's Ridge, was mentioned as a good example of road building. The new road was more than three times as long as the old one, but a load of 2,000 lbs. can be easily hauled over it, while on the former line a load of 1,000 lbs. was difficult to draw. The road was constructed by the county convicts working under the direction of an engineer. It is said that in Alabama a number of excellent roads have been built by convict labor. At the next meeting of the association, on April 11, city street paving was the subject for discussion.

Western Society of Engineers.

The regular business meeting of the Western Society of Engineers took place at the society's rooms, 1737 Monadnock Block, Chicago, Wednesday evening, April 3. The death of one of the members, Mr. Warren Collins Smith, was reported, and a committee was appointed to draw up resolutions. A communication from the St. Louis Engineers' Club, in the shape of a report of the Committee on Standard Gages for the Thickness of Metals, was read. A committee of three was appointed to take the matter up. After the regular meeting a "club smoker" was held. The attendance at the meeting was 62. At the directors' meeting, preceding the society meeting, ten new members were elected. At the next meeting, which is to be held at the Armour Institute April 17, Mr. Horace E. Horton will present a paper.

The Southern and Southwestern Railway Club.

The next meeting of the Southern and Southwestern Railway Club will take place at the Kimball House, Atlanta, Ga., on Thursday, April 18, 1895, at 10 o'clock a. m. The subjects for discussion will be:

- 1st. "Revision of Master Car Builders' Rules of Interchange."
- 2d. "What is the Cause of Uneven Wear of Driving Wheel Tires, running in the Southwestern Territory?" Messrs. Wm. Rutherford, P. H. Schrieber, W. H. Hudson, special committee.
- 3d. "What is the Most Economical Method of Obtaining Compressed Air for General Use in Railroad Shops, and its Application?" Messrs. W. F. Gentry, John S. Cook, W. F. Brodnax, W. J. Hartman, special committee.
- 4th. Discussion of the report on Counter-Balancing of Driving Wheels.
- 5th. Additional report of Committee on Draft Sheets and discussion of the subject.
- 6th. "What is the Most Economical Tonnage Spring; The Elliptic, Half-Elliptic or the Coil, considering the first cost and the duration of efficiency of each, and its effect on the Rolling Stock and Track?" Messrs. R. P. C. Sanderson, Geo. W. Morris, S. A. Charpiot, special committee.

National Association of Manufacturers.

The Executive Committee of the National Association of Manufacturers, which it will be remembered, was organized in Cincinnati last January, met in Philadelphia, March 13, the President, Mr. Thomas Dolan, of Philadelphia, in the chair. The Committee selected certain Vice-Presidents to fill some of the vacancies still existing; namely, Mr. S. B. Foote, of St. Paul, for Minnesota; Mr. J. L. Abernethy, of Leavenworth, for Kansas; Mr. J. H. Shakespear, of New Orleans, for Louisiana; Mr.

Thomas E. Eryson, of Seattle, for Washington; Mr. H. G. Morse, of Wilmington, for Delaware, and Mr. J. T. Carroll, of Butte, for Montana. Other vacancies were not filled.

The Committee ruled that under the constitution national associations of specific industries would be admitted to membership under certain conditions; also, that local clubs or associations of manufacturers could be admitted as well as associate members.

The time and place of the first annual meeting were fixed as Oct. 15, 1895, at Chicago. The Secretary of the association is Mr. E. P. Wilson, room A, Chamber of Commerce, Cincinnati, O., from whom any further information can be obtained.

National Convention of Railroad Commissioners.

The seventh annual convention of State Railroad Commissioners will be held at the office of the Interstate Commerce Commission, No. 1317 F street, Sun Building, Washington, D. C., on May 14.

The Railroad Commissioners of all States, and State officers charged with any duty in the supervision of railroads, are invited to attend and participate in the discussion. The Association of American Railway Accounting Officers has also been invited to send delegates to the convention, and join in the consideration of such questions of special interest to their association as may arise.

At the last convention committees were appointed on the following subjects and directed to report to the next convention: Railway Statistics; Uniform Classification of Freight and Legislation.

The following resolution was adopted at the last meeting: "That a committee of five be appointed to select officers for and subjects to be presented at the next annual convention of this association, to solicit papers upon the same, either from members of the association or from those not connected with the organization, and to prepare, as far as possible, a programme of proceedings;" and the following "Committee on Organization and Programme for the next convention" was named: I. B. Brown, of Pennsylvania; J. W. Luke, of Iowa; J. W. Yantis, of Illinois; James W. Rea, of California, and Edward A. Moseley, of the Interstate Commerce Commission.

It has been suggested that a session of three days would be advisable in view of the important topics which are likely to come before the convention for consideration.

PERSONAL.

—Mr. Charles H. Swift, district passenger agent for the Wabash Railroad Company, at Springfield, Ill., died at that place last week of pneumonia.

—Mr. W. H. Hunt, Paymaster of the Central Vermont Railroad and business manager of a local paper at St. Albans, Vt., died at that town on April 9.

—Mr. Luther O. Crocker, well known as a manufacturer of conductors' punches, died at his home in East Braintree, Mass., on April 7. He was 66 years old.

—Mr. C. L. Pullman, formerly Contracting Agent of the Pullman Palace Car Co., has recently been elected President of the Dudley Packing Co., and will have his headquarters in New York City.

—Mr. H. P. Manks has been appointed agent of the Blue and Canada Southern fast freight lines at Chicago. Mr. Geo. Mackay, who has held this position for several years, has been appointed General Western Travelling Agent, with headquarters at Chicago.

—Mr. W. G. Nevin has been appointed General Purchasing Agent of the Atchison, Topeka & Santa Fe Railroad Co., in the place of Mr. W. G. Fuller, resigned. W. E. Bailey, late Chief Clerk in the General Auditor's office, succeeds Mr. Nevin as Assistant to the Vice-President.

—Mr. W. G. White, for a number of years assistant engineer of the Pittsburg, Fort Wayne & Chicago, at Pittsburg, has been promoted to be engineer of maintenance of way on the E. & A. division, to take the place made vacant by the appointment of H. W. Byers to the Superintendency.

—Capt. D. S. Hudgins, of Raleigh, N. C., one of the oldest officials of the Seaboard Air Line, having been connected with it for over 30 years and for a number of years past Superintendent of Telegraph of the Seaboard Air Line with headquarters at Raleigh, will retire from the service April 15. The position of Superintendent of Telegraph has been abolished.

—Mr. Henry Hammond, who died at Danielsonville Conn., April 3, was a former State Railroad Commissioner, having been elected to that office three times when it was filled by direct vote of the citizens. He had been a member of both branches of the State Legislature, and had held other prominent offices, and in recent years had been President of a national bank at Killinger.

—Mr. C. S. Sims, Assistant Engineer of Maintenance of Way of the Western Division of the Pennsylvania Company, has been promoted to the position of Engineer of Maintenance of Way of the Toledo Division of the same company, with headquarters at Toledo, and will assume his new place to-day, succeeding Mr. Walter Newhall, who has been transferred to another division.

—Mr. B. H. Payne has recently been appointed Assistant General Passenger Agent of the Missouri Pacific succeeding A. A. Heard, who has removed to Buffalo as General Passenger Agent of the Northern Steamship Co. Mr. Payne is at present Division Passenger Agent on the Union Pacific Railroad, but was formerly with the Missouri Pacific Co., in a corresponding position to that to which he now returns.

—Mr. Richard Dudgeon, an inventor of considerable note, and an extensive manufacturer of hydraulic tools, died at his home, in New York City, this week, aged 76 years. He was born in Scotland, but had lived in this country since childhood. He entered a machine shop while a very young man, and had been engaged in that business all his life, most of the time in his own name. His first invention of a hydraulic jack was made over 35 years ago. Since that time he has devoted himself assiduously to developing that class of tools, and had built up a large and profitable business.

—Mr. William A. Nettleton has been appointed Superintendent of Motive Power and Machinery of the Kansas City, Fort Scott & Memphis Railroad. He succeeds Mr. J. S. Crum, who has held that office for many years, and has been with the railroad company for about 25 years altogether. He now retires on account of advancing years and enfeebled health, but is to retain a connection with the company and perform such duties as his health will allow. Mr. Nettleton is a son of the President of the company and has been Assistant Superintendent of Motive Power since August, 1893. Previous to that he was Superintendent of Terminals at Kansas City.

—Mr. George W. McGuire, representing the National Malleable Castings Company and the Butler Drawbar Attachment Company, died at Savannah, Ga., April 4. He had been spending the winter in Savannah, Ga., on account of his health and being much improved had determined to come North shortly, when a cold resulted in his death from congestion of the lungs. He was 49 years old and had been connected with the railroad department of the National Malleable Castings Company for the last 15 years. As a business man Mr. McGuire was able, energetic and plucky, and at the time when his health broke down he had made for himself an important place in the railroad trade. As a man he was genial and loyal and had an army of friends. For the last two years he has carried on a gallant struggle against the malady which finally killed him.

—Mr. J. S. Leeds, Traffic Manager of the Traffic Association of San Francisco, has resigned that office and returned to his home near Cincinnati. Mr. Leeds has held the office since 1891, having been previously Freight Traffic Manager of the Missouri Pacific Railroad. The Traffic Association was an association of merchants of San Francisco, organized to secure relief from the high freight rates of the Southern Pacific Railroad. The most important work of the association was in raising a fund of something like \$300,000 to establish a steamship line to compete with the Pacific Mail Co., in connection with the Panama Railroad. When this fund was exhausted the steamships were purchased by the Panama Railroad. In his letter to the Directors resigning his office, Mr. Leeds says that as competition with the Pacific Mail Line has been secured, and the building of the San Joaquin Valley road seems assured, the work for which the association was chiefly established has been accomplished.

—Colonel H. S. Haines, Vice-President of the Plant System and President of the American Railway Association, who was chosen last autumn as a delegate from that association to the World's Railroad Congress, will sail from New York on the American Line steamer *New York* on June 12. The Executive Committee, which is to appoint seven other delegates, has already selected as one of these Mr. W. F. Allen, Secretary of the Association, who will sail on the same vessel with Colonel Haines. The other six delegates will probably be announced within a few days. The *New York*, *New Haven* & *Hartford* will send its full quota of eight delegates and they also will sail on the *New York* June 12. These delegates are: Charles P. Clark, President; C. H. Platt, General Superintendent (New Haven System); E. G. Allen, General Superintendent (Old Colony System); F. S. Curtis, Chief Engineer; John Henry, Jr., Superintendent of Motive Power; S. A. Gardner, Superintendent of Marine Construction; C. C. Elwell, Road Master, New York Division; J. G. Parker, Secretary.

—Mr. Thomas A. Bissell, who has been so long identified with the Wagner Palace Car Co. as manager of its extensive shops at East Buffalo, N. Y., has recently resigned. He proposes to take a long rest and will probably not again take up active work. He has been succeeded as Manager of the Buffalo works by Mr. E. A. Benson, who has been assistant under Mr. Bissell for some years. Mr. Bissell went to the Wagner Company in 1886 and took charge of the East Buffalo shop, which was then a small affair. Its development to the present large establishment has been entirely under the direction of Mr. Bissell. He has been engaged in car building practically all his business life. Early in his career he was connected with the Chicago, Burlington & Quincy at Aurora, in charge of the erection of the buildings for that road, and in other capacities, finally being given charge of the rolling stock of the company. He had already worked out several useful inventions, and while at Aurora designed a freight car door which came into considerable use. In 1872 he was employed by Mr. George M. Pullman to develop the Detroit Car Works of the Pullman Company, and he remained at Detroit until 1881, when he went to Dayton in a responsible position with the Barney & Smith Car Co. Five years later he went to the Wagner Palace Car Co., and has since been manager of the East Buffalo shops. Mr. Bissell is the inventor of the vestibule and extension platform on the Wagner cars, which is now manufactured by the Gould Coupler Co., and he also invented a freight car truck, for the design which he is said to have received \$20,000 from the Pullman Co., and a lock for sleeping car berths. Mr. Benson, the new manager at East Buffalo, has had nearly as long an experience in car building as Mr. Bissell. He was employed in the Burlington shops at Aurora when Mr. Bissell was a draftsman there, and he went to the Pullman shops at Detroit when the latter was in charge of those works, remaining there from 1872 until 1879. Later he was in charge of the machinery department of the Missouri Car & Foundry Co. for a short time, returning to the Pullman Co. in 1880, when the shops at the new town of Pullman were just beginning business, and he is said to have made out the first requisition for tools and materials issued for car building purposes at the Pullman works. A year later, his health failing, he was transferred to the St. Louis shops of the same company, then being built, and was in charge of those shops for five years, until 1880, when he resigned to go to the Wagner Co. as Master Car Builder, first of the old shops on Seneca street, Buffalo, and later at Schenectady. When the new shops at East Buffalo were started he was made Assistant Manager.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—W. W. Currier has been appointed Trainmaster for the first district of the Alabama Great Southern. He was formerly on the Northern Pacific.

Bridgeport.—The following are the incorporators of this company: D. B. Shepp, Philadelphia, President; Edgar A. Murphy, J. W. Shepp, R. S. Parkinson and Henry Parker, of Philadelphia; N. H. Larzalere, Norristown, Pa., and W. B. Krich, Reading, Pa.

Central Pacific.—The present directors of the Central Pacific Railroad Company were re-elected at the annual meeting at San Francisco, on April 9.

Chicago, Indiana & Eastern.—The officers of the company are: President and General Manager, M. H. Alberger, 171 La Salle street, Chicago; Vice-President, William S. McCrea, Board of Trade Building, Chicago; Secretary, Walter C. Chiles, New York Life Building, Chicago; Treasurer, George N. Catterson, 24 Kentucky avenue, Indianapolis, Ind.

Cleveland, Lorain & Wheeling.—M. G. Carrel has been appointed General Passenger Agent of this company, with office at Cleveland.

Chesapeake & Ohio.—Thomas A. Garrigan, recently Traveling Passenger Agent of the old Ohio & Mississippi

and the Baltimore & Ohio Southwestern, has been appointed Southwestern Passenger Agent of the Big Four and Chesapeake & Ohio, with headquarters in Huntington, W. Va.

Fort Worth & Rio Grande.—The annual election of directors and officers of the railroad at Fort Worth, Tex., on April 3, resulted as follows: John Hornby, Fort Worth, President; C. M. Wicker, New York, Vice-President; A. K. Dixon, Fort Worth, Secretary; J. Van Rensselaer, Treasurer. The directors are: H. B. Hollins, John S. Ellis and C. M. Wicker, of New York; J. P. Smith, K. M. Van Zandt, E. W. Taylor, B. B. Paddock and John Hornby, Fort Worth, and Brooke Smith, Brownwood, Tex.

B. T. Boozee having resigned the office of general freight and passenger agent of the road at Fort Worth, Tex., Mr. L. B. Comer has been appointed to succeed him temporarily.

Galveston, Houston & Henderson.—The stockholders of the road held their annual meeting at Galveston, Tex., on April 2. J. L. Kane, A. Bardash, R. B. Baer, S. W. Gaines, Wm. R. Johnson, F. L. Lee and T. J. Boyles were re-elected Directors, and the following were re-elected by the Directors: J. L. Kane, President; R. B. Baer, Vice-President; A. A. Vanalstine, Secretary and Treasurer, and O. S. Hegd, Assistant Secretary and Treasurer.

Houston & Texas Central.—The annual meeting of the stockholders was held at Houston, Texas, on April 1, and these directors and officers elected: T. F. Hubbard, of New York; I. E. Gates, of New York; G. A. Quinlan, of Houston; C. W. Bein, of Houston; T. W. House, of Houston; J. M. Lee, of Houston; J. Kruttschnitt, of Houston; A. P. Root, of Houston; E. W. Cave, of Houston. Executive officers: President, T. H. Hubbard; Vice-President, G. A. Quinlan; Secretary and Treasurer, E. W. Cave; Assistant Secretary and Treasurer, I. E. Gates.

Indiana, Illinois & Iowa.—General Manager T. P. Shonts has issued the following circular: L. H. Miller, who, since his appointment as General Superintendent of this company, has had charge of the maintenance of equipment, as well as the conducting of transportation, has asked account of ill-health, to be relieved of a portion of his duties. F. C. Raff, Commercial Agent at South Bend, Ind., is therefore appointed Superintendent, with headquarters at South Bend, and will have charge of all matters pertaining to the Transportation Department. L. H. Miller is appointed Master Mechanic, with jurisdiction over the Motive Power, Car and Machinery Departments, with headquarters at Kankakee, Ill. The offices of Commercial Agent and General Superintendent are abolished.

Louisville, Evansville & St. Louis.—O. W. Putnam, Trainmaster, has been appointed Superintendent, with headquarters at Princeton, Ind., and will assume the duties formerly performed by the Assistant General Superintendent, which office has been abolished.

Montpelier & Wells River.—From April 1, 1895, a separation of the accounting department from the traffic department will be made, the latter continuing as heretofore under the direction of Mr. F. W. Morse, General Freight and Passenger Agent. Mr. W. C. Berry has been appointed Auditor and Cashier, to whom all reports and correspondence relative to accounts should be addressed and all remittances made.

New York, Pennsylvania & Ohio.—The jurisdiction of Ira Belknap, Superintendent of the second division of the New York, Pennsylvania & Ohio Railroad, has been extended over the first division, with headquarters at Meadville, Pa., vice J. S. Matson, now Chief Train Dispatcher of the first and second divisions at Meadville, Pa. The office of Engineer of Signals has been abolished and the duties pertaining thereto will hereafter be discharged by the maintenance of way department. Reports heretofore addressed to G. H. Macdonough, Engineer of Signals, should hereafter be forwarded to A. Mordecai, Assistant Chief Engineer, at Cleveland, O.

New York & Texas Steamship Co.—Arthur Sinclair, Jr., is now the New England Agent of the Mallory Steamship Lines, with headquarters at 366 Washington street, Boston. He was recently with the Merchant & Miners' Steamship Co., and has had a long experience in transportation business.

Pennsylvania.—Edward D. Gardner has been appointed Train Master of Middle Division, Philadelphia & Erie Railroad Division, vice John L. Belford, deceased. Thomas V. Mulligan has been appointed Division Operator of the Middle Division, Philadelphia & Erie Railroad Division, vice Edward D. Gardner, promoted.

Pittsburgh Connecting.—The officers of the company, recently organized, are: Frank L. Slocum, Pittsburgh, President, and Samuel Woods, James Gardner, Jr., James J. Kay, William A. Dinker and Willis F. McCook, of Pittsburgh, Directors.

Pittsburgh, Shenango & Lake Erie.—The annual meeting of the company was held at Meadville, Pa., on April 2. Samuel B. Dick was elected President, and the Board of Directors was also selected.

Southern Pacific.—At the annual meeting of the Southern Pacific Railroad Company, at San Francisco, on April 4, 1,166,000 shares of stock were represented out of a total of 1,209,000 shares. By a unanimous vote the old board of directors was re-elected except that George Crocker succeeds W. H. Crocker, and Charles C. Lathrop succeeds S. T. Gage.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Bridgeport.—The company was incorporated in Pennsylvania this week to build from a point on the east side of the Schuylkill River road, opposite property of the Pennsylvania Railroad, in the village of Swedesburg in Upper Merion Township, Montgomery County, Pa., and continuing parallel with the Schuylkill river southward to Swedeland, to a point on the Hecksher Furnace property, the length of the road being a little over a mile. Daniel B. Shepp, Philadelphia, is President.

Chicago, Florence & Gulf.—A charter was secured for this company at the recent session of the Alabama Legislature. The incorporators are Paul Hodges, E. A. Mitchell, W. C. Jemison and associates. The road is to be built from Fort Morgan, Baldwin County, on the Gulf, to the Tennessee State line, in Lauderdale County on the north. Its stock is limited to \$18,000 a mile. It may organize when \$100,000 of its stock is taken by bona fide subscribers.

Chicago, Indiana & Eastern.—The construction work on this railroad through middle Indiana has been progressing steadily for some weeks past since the con-

struction of the line was undertaken by Mr. Alberger, of Chicago. At present about 150 men are at work and it is expected to commence the track-laying during the week. The section of road now being built is from Converse via Fairmount and southeast to Muncie, connecting at the latter place with the L'ke Erie & Western and the Cleveland, Cincinnati, Chicago & St. Louis Railroads, the distance between the two terminal points being 43 miles. The work of building the road has not been difficult, and there have only been six bridges, all trestle structures. The longest is one of 600 ft. crossing Kirkwood Creek. The company at present owns 2 locomotives, 3 passenger cars and 6 freight cars. The contractor for the work now being done is H. E. Drew, of Indianapolis, Ind., and the Chief Engineer of the company is Fremont Wilson, of Fairmount. The completion of the railroad has been undertaken by Chicago interests, of which H. M. Alberger is the head, and he has within a few months been elected President and General Manager of the company. Other officers are given in another column.

Conshohocken Connecting.—This company was incorporated in Pennsylvania to build a railroad in Plymouth Township, about a mile in length, connecting with the Pennsylvania road. Daniel B. Shepp, of Philadelphia, is President of this company.

Fremont, Elkhorn & Missouri Valley.—The reports that the company was to undertake a further extension of its northwestern line beyond Middle Creek, Wyo., are unfounded, the officers saying that no such work has ever been contemplated. The cattle traffic on this line is very large and the company is now building four large water storage reservoirs to insure a plentiful supply of water along the cattle drives. No other work of importance is to be done this year.

Galveston, La Porte & Houston.—President James Waldo announces that negotiations have been practically completed for the consolidation of the Galveston & Western Railroad with this company. The Galveston & Western operates about 10 miles of railroad on Galveston Island, south of the town of Galveston, to Nottingham. It has planned to build a bridge across Galveston Bay to the main land, and the Galveston, La Porte & Northern also has franchises for such a structure, and there was some conflict between the two companies as to their respective legal rights in the matter. The railroad has something over two miles of line to build through Galveston to the West Bay, the franchise for which had lapsed. An effort is now being made to have this revived to change the gage of the road from 3 ft. to standard, and to go ahead at once with the erection of the bridge across Galveston Bay, connecting on the western side with the tracks of the Galveston, La Porte & Northern, which will then have a continuous road from Houston to Galveston.

Guyandotte & Atlantic.—The Secretary of State of West Virginia has issued a certificate of incorporation to the company, which proposes to build a railroad beginning on the Ohio River, near Huntington, and extending up to the Guyandotte River and down the Blue Stone River to the New River, up the New River to a point in Mercer County, near the line between the States of Virginia and West Virginia. The principal office will be in Charleston, W. Va.

Iron Range & Huron Bay.—Superintendent Abbot, of this railroad, states that the short extension into Champion, Mich., to connect with the Chicago & Northwestern, Chicago, Milwaukee & St. Paul and the Duluth, South Shore & Atlantic Railroads will be begun immediately, and that the railroad will be opened for operation as soon as this work is completed. The railroad has been graded and track laid through the mining district about Champion, in the northern peninsula of Michigan, north to Huron Bay, but no work has been done on the railroad for the last two years. It is about 35 miles long. It is possible that the railroad will be extended during the year to Ontonagon.

Long Island.—The extension of the North Division of this railroad beyond Port Jefferson to Wading River is now practically completed, the work remaining to be done being chiefly in finishing the roadbed now entirely graded. This extension is about 11 miles long extending due East, and was undertaken last summer. There has been considerable bridge work on the line, but the structures are now all erected. It is said that this extension may be completed beyond Wading River about five miles to the southeast to the town of Manor on the Central Division, but that work has not been definitely decided upon.

Louisville, New Albany & Chicago.—That portion of the main line between Monon and Indianapolis is being relaid with 75-lb. rails, and the new section is expected to be in place between these points within a few weeks. The work has been going on all the spring. The distance now being laid with the heavier section is 95 miles altogether, and it is expected that the same section will be put in on the entire main line within a short time.

Maine Shore Line.—There seems to be some evidence of a revival of interest in this long projected line in Eastern Maine. Col. J. W. Green, who has been the chief means of keeping the project alive for some years announces that he expects to complete an arrangement within a few weeks at New York which will enable him to do considerable work on the line this year. He recently went over the route with Engineer Hilbard, a representative of the interests with which he has been negotiating. The project is for a line through the southern part of Washington County, Me., from near Ellsworth or some other point on the Bar Harbor Branch of the Maine Central running south of Bangor to Eastport or Calais.

Missouri, Kansas & Texas.—A. B. Thurston, with a party of engineers, has commenced the final survey of the new line between Sedalia and Kansas City. The surveyors started near Greenridge, and they will run the line nearly due west over a level tract of country to Holden. The line will probably be ready for contractors about June 1.

Muskogee, Oklahoma & Western.—A charter was issued to the company, at Guthrie, Okla., last week. G. W. Sutton is President; Col. J. L. Morphis and J. W. Jordan, Vice-Presidents; E. W. Morphis, Secretary; W. H. Herbert, Treasurer. The road is to be built from Muskogee to Enid, a distance of 200 miles, passing through Cleveland, Pawnee and Perry, Oklahoma.

Pittsburgh Connecting.—This company was incorporated in Pennsylvania last week, to build a road from a connection with the Pennsylvania Railroad at east of Hawkins Station, southerly to a connection with the Pittsburgh & Connellsville Railroad, and a connection with the Pittsburgh, McKeesport & Youghhegany road and thence to the Monongahela River, all in Allegheny County. The total length of the road will not exceed

two miles. Frank L. Slócum, of Pittsburgh, is President.

Port Jervis, Monticello & New York.—C. W. Haines, of Kinderhook, N. Y., who has recently obtained control of this short line north of Port Jervis, N. Y., and been elected president of the company proposes several important extensions of the line. It is said that an extension beyond Monticello down the Rondout Valley to Kingston, N. Y., is likely to be undertaken during the year by the firm of Haines Brothers.

Ottawa, Arnprior & Parry Sound.—The construction work now under way on this road is on the section west of Long Lake, Ont. The contract for the grading from Long Lake to Potter Lake, Ont., a distance of 30 miles, has been let this season, and some 200 men are employed on rock work, piling, clearing right of way, etc. Messrs. E. T. Fauquier, Ottawa, and O'Neil & Ferguson, of Ottawa, are the contractors. There is, also, about 10 miles at the Parry Sound end of the line under contract to Poulin & Fitzpatrick, of Parry Sound, Ont. Between Emsdale and Potter Lake is a gap of 37 miles, which, in all probability, will be built next season, the location of which has just been completed. The company built 80 miles last season and the end of track is now 144 miles west of Ottawa, as stated last week. From Emsdale west toward Parry Sound 40 miles of the Parry Sound Railroad is now finished and turned over to the operating department. G. A. Mountain, of Ottawa, is Chief Engineer in charge of the work.

Vining & Coleman.—The Texas Railroad Commission has granted authority to the railroad to issue bonds, not to exceed \$13,500 a mile, for the entire distance from Vining, in Coleman County, to Coleman, a distance of 20 miles. The road is to reach the Vining coal fields in McCulloch county, near the Colorado River. W. L. Vining, of Austin, and W. N. Cole, Jr., of New York, are among the organizers.

Winston & South Bound.—This road, which was incorporated by the North Carolina Legislature last month, and which attracted little attention at the time, has a promise of becoming of some importance, as it is intended to be a link of a new continuous line from New York to Florida. The new road will be an extension of the Roanoke & Southern now built from Roanoke, Va., to Winston, N. C. (and operated under a lease by the Norfolk & Western) to Monroe, a distance of 147 miles, thence to Ridge-way, S. C., where it will have a connection to Columbia, S. C., and thence to Savannah, Ga., where it will connect with the Florida Central & Peninsular. So, with the completion of the Winston & South Bound road, the line from Florida to New York will be over the Florida Central & Peninsular to Savannah, over the South Bound to Columbia, over the Winston & South Bound to Winston-Salem, over the Roanoke & Southern to Roanoke, thence over the Shenandoah Valley division of the Norfolk & Western road to Hagerstown, Md., over the Cumberland Valley road to a connection with the main line of the Pennsylvania road, and over that road to New York and the East.

GENERAL RAILROAD NEWS.

Atchison, Topeka & Santa Fe.—The General Reorganization Committee has this week announced the term of the amended plan of reorganization of the company. Under the plan the Atchison general mortgage 4 per cent. bonds, with the unpaid coupons since Jan. 1, 1894, will receive 75 per cent. of the principal in new general mortgage 4 per cent. bonds, and 40 per cent. in 4 per cent. adjustment bonds interest payable only out of net earnings, non-cumulative to July 1, 1900, and cumulative after that date.

Atchison 4 per cent. second mortgage bonds, class "A," will receive 113 per cent. of their par value in 5 per cent. non-cumulative preferred stock of the new company. The bonds are assessed 4 per cent.

Atchison 4 per cent. second mortgage bonds, class "B," and Atchison income bonds of 1889, and all subsequent coupons attached, will receive 118 per cent. of their par value in the new 5 per cent. preferred stock. These bonds are assessed 4 per cent.

Atchison capital stock is assessed \$10 a share, of which \$3 must be paid at the time of deposit. Stockholders will receive for each \$100 share and assessment of \$10 paid thereon, \$100 in common stock and \$10 in preferred stock of the new company.

The capitalization of the Atchison Company under the reorganization will compare as follows with the present figures: (1.) New general mortgage four, \$96,990,582, with fixed interest of \$3,879,623, and 4 per cent. adjustment bonds, \$51,728,311, non-cumulative until after July 1, 1900, in place of present general mortgage four, amounting to \$129,320,776, with fixed interest of \$5,172,831. (2.) New 5 per cent. non-cumulative preferred stock, \$111,485,951, in place of \$77,937,500 second mortgage "A" bonds, with fixed interest of \$3,117,500; \$10,000,000 second mortgage "B" bonds, with fixed interest of \$400,000, and \$1,253,607 income bonds (exchangeable for "As") with fixed interest of \$50,144. (3.) New prior lien 4 per cent. bonds, \$12,020,414, with fixed interest of \$480,816, in place of \$9,000,000 guarantee fund 6 per cent. notes, with \$540,000 fixed interest; \$1,750,000 equipment trust, series "A," 5 per cent. bonds, with \$87,500 fixed interest, and \$1,270,414 equipment lease warrants. (4.) New common stock of \$102,000,000 in exchange for a like amount of present capital stock. The Chicago & St. Louis first mortgage 6 per cent. bonds, amounting to \$1,500,000, with \$90,000 fixed interest, may be left undisturbed. The capitalization under the reorganization will amount to \$377,288,208, with fixed interest of \$4,528,547, against an existing capitalization of \$335,595,247, with fixed charges of \$9,536,083.

The new general mortgage is to provide for the issue of additional general mortgage bonds not exceeding the following amounts: \$1,500,000 to take up, if necessary, the Chicago & St. Louis first mortgage 6 per cent. bonds; \$1,500,000 for taking up the outstanding bonds provided for under the Atchison circular of Oct. 15, 1889, consisting of various old liens; \$15,500,000 to take up existing guarantee fund notes, equipment bonds and existing car trust obligations; \$30,000,000 for construction and improvements and additions, such bonds not to be issued at a rate to exceed \$3,000,000 for each fiscal year, and \$20,000,000 to be used for the acquisition of the Atlantic & Pacific, the St. Louis & San Francisco, and the Colorado Midland, and for the improvement of the property acquired. A possible issue of \$17,000,000 prior lien bonds is also provided for, with a view to making additional provision for funding or paying existing guarantee notes, equipment bonds and car trust obligations and for setting apart a fund to insure against contingency. The plan also reserves the right to issue \$20,000,000 additional preferred stock for the acquisition and improvement of the St. Louis & San Francisco, Atlantic & Pacific and Colorado Midland railroads. The cash assessments provided for will furnish the company with \$13,507,644 for floating debt, receivers' certificates and working capital for the new company.

Atchison, Topeka & Santa Fe.—The earnings of the company for February are reported in the following table:

	1895.	1894.	1893.
Gross earn.....	\$2,899,116	\$2,510,716	\$3,538,880
Oper. exp.....	2,503,844	2,304,102	2,782,727
Net earn.....	\$395,271	\$206,614	\$756,153
Prop. exp. to gross.....	79%	81%	76%
Net 8 months.....	7,262,619	9,228,544	10,931,576
Atchison proper:			
Gross earn.....	\$2,091,389	\$2,042,810	I. \$51,379
Oper. exp.....	1,686,297	1,607,073	I. 19,224
Net earn.....	\$405,091	\$435,737	I. \$32,354
St. Louis & San Francisco:			
Gross earn.....	\$143,404	\$137,674	D. \$24,270
Oper. exp.....	274,403	289,746	D. 15,703
Net earn.....	\$139,360	\$147,928	D. \$8,567
Atlantic & Pacific:			
Gross earn.....	\$279,702	\$220,908	I. \$58,704
Oper. exp.....	261,310	254,172	I. 7,133
Net earn.....	\$18,392	Def. \$33,174	I. \$51,565
Colorado Midland:			
Gross earn.....	\$111,620	\$109,234	I. \$2,386
Oper. exp.....	82,193	93,166	D. 10,973
Net earn.....	\$29,426	\$16,068	I. \$13,365

Canadian Pacific.—The list of shareholders of the company, published at the recent annual meeting, shows that the directors hold shares of the company's stock as follows: Sir Donald A. Smith, 10,000 shares; Sir W. C. Van Horne, 1,500; T. G. Shaughnessy, 250; R. B. Angus, 2,000; E. B. Osler, 500; Sanford Fleming, 3,000; Lieutenant-Governor Kirkpatrick, 250; George R. Harris, 300; Hon. D. Macinnis, 250; Thomas Skinner, 550; John W. Mackay, 500. Among the other large shareholders are the following: Blake Brothers, New York, 26,280; H. Beatty, 1,300; Earl of Clanwilliam, 1,550; Canada Life Assurance Company, 2,000; Jesse Joseph, 1,200; Lord Mount-Stephen, 4,750. The total stock of the company is 650,000 shares.

Chester & Lenoir.—A correspondent in North Carolina writes that it was reported that this week and generally believed that the Southern Railway had absorbed this road, which extends from Lenoir, N. C., to Chester, S. C. The road was formerly operated for a number of years by the Richmond & Danville, but for the last year or two it has been successfully operated by its stockholders as an independent line, and every effort has been made since to prevent its being absorbed by any of the large systems. President Harper has since denied the truthfulness of the report.

Colorado Central.—Judge Hallett, of the United States Court at Denver, has made an order on the receivers of the Union Pacific Railroad requiring them to answer the petition of Frank Trumbull, Receiver of the Union Pacific, Denver & Gulf road, and show on what grounds they claim to hold possession of bonds of the Colorado Central alleged to be the property of the Union Pacific, Denver & Gulf, and to show cause why they should not be required forthwith to deliver possession of such bonds to Receiver Trumbull.

Evansville & Terre Haute.—A special meeting of the stockholders of the railroad has been called for May 8 at Evansville, Ind., to authorize the directors of the company to increase the capital stock by the issuance of 25,680 additional shares of common stock, to be used for the purpose of exchanging the same for bonds of the Evansville & Richmond, and in taking up the bonds to compromise and settle claims growing out of the guarantee of the Evansville & Richmond bonds by the Evansville & Terre Haute Railroad. The holders of the increased common stock given in exchange for the bonds will be entitled to preferred stock equal in amount to the proposed increase of common stock.

Lake Street Elevated.—A receiver has been asked for the Lake Street Elevated road in the United States Circuit Court, at Chicago, by William Ziegler and other New York stockholders. It is represented that the line is not being operated for the benefit of the stockholders, but for the profit of Charles T. Yerkes and the West Chicago Street Railroad Company, of which Mr. Yerkes is the practical owner. The stock of the Lake Street "L" is \$10,000,000 and the bonded indebtedness \$7,419,000, besides other indebtedness. It is asserted that the elevated road is so run as to do the least damage possible to the West Chicago street railway line, of which it is, or should be, a most formidable competitor. It is alleged that a representative of the street railway interests has purchased a majority of the stock of the elevated road, and has given various rights of the road to the street railway company. Mr. Ziegler prays for an injunction to restrain the Union Elevated Company, the West Chicago Street Railway Company, the Northwestern Railway Company, and the Columbia Construction Co., to which he says various rights of the elevated company have been granted, from acting under the privileges, and that the Court inquire into the representations made.

Lehigh Valley.—A loan for a sum under \$3,000,000 has been arranged in London, and the proceeds will be used to refund the floating debt now maturing. The company has been carrying a considerable floating debt in the form of promissory notes secured by collaterals, and this London loan will take care of all this floating debt at less rates of interest than are now charged in this country. This loan is to continue for a fixed term, and is to be secured by collaterals, the inducements in making it being the saving in interest and commissions, and the better lending conditions compared with ordinary four months' promissory notes.

Montreal & Sorel.—This railroad has been purchased by the Atlantic & Lake Superior Railway, the purchase price being said to be about \$200,000. The Atlantic & Lake Superior is the project organized by C. N. Armstrong, of Montreal, and others of the present directors as a new line through Canada to the Sault Ste. Marie. The Montreal & Sorel road is about 45 miles long in Quebec. The Great Eastern and the Baie des Chaleurs roads are also included in the consolidation.

Northern Pacific.—The Northern Pacific receivers have taken steps to cancel the long-standing trackage contracts between the Great Northern and the Northern Pacific and the Minneapolis Union Depot Co. and the Northern Pacific concerning the use of tracks between Minneapolis and St. Paul and the use of the terminals at Minneapolis.

Oregon Short Line & Utah Northern.—Judge Sanborn, of the United States Court in St. Paul, has issued an order, returnable May 1, to show cause why a separate receiver should not be appointed for the Oregon Short Line. If the Union Pacific receivers succeed in showing cause, the recent appointment of J. M. Egan as separate

receiver by the United States Court at Portland, Ore., will be nullified.

Pittsburgh, Shenango & Lake Erie.—The annual meeting of the company was held at Meadville, Pa., on April 2. The president's report shows for the fiscal year ending June 30, 1894, gross earnings of \$475,651 and net earnings of \$165,133. The last six months of 1894 show net earnings of \$100,000 and the first three months of 1895 show an increase of \$23,000, or 30 per cent. over the corresponding months of last year. Contracts for coal from Shenango district already made for this year are over 1,000,000 tons.

Savannah & Western.—The several opposing committees of bondholders of this company have recently come to terms and an announcement is made that united action of the bondholders for the reorganization will now be possible under the Protective Committee, of which Simon Borg, of New York, is President.

Tennessee Central.—Creditors of the railroad have filed a bill in the Chancery Court of Cumberland County, Tenn., claiming that at least \$100,000 is due for labor, supplies, etc., and asking for the sale of the incomplete road for payment of these debts. The litigation may seriously delay the completion of the road, which was to connect Nashville with the Cincinnati Southern. It is built from Lebanon to Crossville, and has been surveyed east of the latter town to Kingston and Harriman. Col. J. Baxter, of Nashville, is President of the company.

Union Pacific.—The receivers of the company have notified J. P. Morgan & Co., trustees, that they can make no further payments of interest on the collateral trust notes of the company, the committee under the trust indenture has issued a circular showing the present condition of the trust estate. The amount of notes outstanding is \$10,959,000, against which the trustees have \$56,945 in cash for the purchase of notes. The interest on the notes must hereafter be met solely from the income from dividends and interest on securities in the trust, and in 1894 the amount received from these sources was \$489,350. The committee expects that payments from these sources will be continued and that such income will be sufficient to meet the interest due in August next. The committee reiterates its opinion that compulsory sale of the pledged securities would not be for the best interest of the note holders.

TRAFFIC.

Traffic Notes.

The Missouri, Kansas & Texas is now running a regular train of second-class Wagner sleeping cars between St. Louis and Houston. The rate for a berth through is \$3.

The St. Louis, Southwestern, and the Houston, East & West Texas will run a regular refrigerator car twice a week from St. Louis to Houston. It will start from St. Louis Tuesdays and Saturdays.

The Illinois Central recently took from Memphis to New Orleans a single shipment of 10,521 bales of cotton bound for Liverpool. This is said to be the largest shipment ever made from Memphis.

The New York Central announces that the arrangement for checking baggage to and from residences now applies not only at New York and Brooklyn, but is also in effect at Albany, Troy, Utica, Syracuse, Rochester, Buffalo and Niagara Falls.

The Chicago & Grand Trunk, which has been the leader in the recent heavy cutting of east-bound grain rates, has notified the Interstate Commerce Commission that it will cancel its 12-cent rate on grain between Chicago and New York, April 13. The rate was made over the Erie, and that road, it is said, made strong protest.

The Fall River Line steamers now start from New York at 5.30 p. m., instead of 5 o'clock. On and after June 1 the pier of this line at the foot of Murray street, North River, will be known as Pier 18. The boats will begin Sunday trips for the Summer on May 5, and on June 17 the double service will be started, the Priscilla, Puritan, Plymouth and Pilgrim running every night, except that on Saturdays there will be only one boat from the East, and on Sundays only one from New York.

The Trunk Lines have issued tariffs for rail and lake shipments westward for the season at the old basis of 50 cents per 100 lbs., first-class, New York to Chicago. It is expected that the boats will begin running about April 15. The new tariffs to the West, issued in consequence of the abolition of differential rates from the Atlantic seaboard, show an advance in rates to the Mississippi River on freight for points beyond the river, except California. The basis is 87 cents, first-class, New York to the Mississippi River.

Damage by Frost in Florida.

It is said that although many of the orange and lemon trees were killed, and those portions of the crops of fruit that had not been harvested as well as the earlier crops of early vegetables were ruined, a large number of the trees that were supposed to be dead will recover, that half of a normal crop of fruit may be expected next season, and that, by reason of having replanted promptly, the vegetable-growers have a prospect of getting their products to market this year in time to obtain good returns.

Eastbound Shipments.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending April 6, amounted to 60,614 tons, against 60,533 tons during the preceding week, an increase of 81 tons, and against 91,975 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	WEEK TO APRIL 6.		WEEK TO MARCH 30.	
	Tons.	P. C.	Tons.	P. C.
Michigan Central.....	9,665	15.9	8,862	14.6
Wabash.....	6,818	11.3	8,577	14.6
Lake Shore & Mich. South.	6,200	10.2	5,387	8.9
Pitts., Ft. Wayne & Chicgo.	6,068	10.0	5,604	9.3
Pitts., Cin., Chi. & St. Louis.	4,273	7.1	3,872	6.4
Baltimore & Ohio.....	2,029	3.4	2,093	3.5
Chicago & Grand Trunk.....	9,155	15.1	5,912	9.8
New York, Chic. & St. Louis.	3,875	6.4	7,286	12.0
Chicago & Erie.....	10,990	18.1	11,139	18.4
C., C. & St. Louis.....	1,541	2.5	1,521	2.5
Totals.....	60,614	100.0	60,533	100.0

Of the above shipments 3,506 tons were flour, 28,645 tons grain and mill stuff, 10,817 tons cured meats, 7,031 tons dressed beef, 1,348 tons butter, 900 tons hides and 6,742 tons lumber.